READ IOWA HISTORY

EDUCATOR MATERIALS




# Iowa's Corn and Agriculture Industry

LESSON PLAN FOR SUPPORTING QUESTION

**How has farming in Iowa seen continuity and change?**

4TH GRADE

STATE HISTORICAL SOCIETY OF IOWA
IOWA DEPARTMENT OF CULTURAL AFFAIRS

LIBRARY OF CONGRESS
TEACHING WITH PRIMARY SOURCES

# Introduction to Read Iowa History

## About Read Iowa History

Through the Library of Congress Teaching with Primary Sources grant, the State Historical Society of Iowa developed Read Iowa History — free, downloadable K-5 lesson plans to build and develop reading and critical thinking skills with primary sources in the classroom.

**Primary sources** (from the digital **Primary Source Sets collection**) are used to help students learn from multiple perspectives, develop primary source-based claims and evidence, and to interpret documents and images of the past. These lessons were developed with the Iowa Core Social Studies and Literacy Standards. Each unit includes ready-to-use source material, worksheets, educator lesson plans and assessment tools and activities. You, the educator, are encouraged to explore the unit, and use materials as you see fit for your students. You are welcome to alter lesson plans, worksheets and assessments to best align with their curriculum.

Please check out the **Primary Source Sets toolkit** to learn more about using primary sources in the classroom.

## What's Included

### Educator Materials

Sources are accompanied by an educator lesson plan. This plan includes: the unit compelling question, unit supporting question, objectives, background information, vocabulary list or cards, a materials list and instructions. There also is a "formative assessment" to wrap up each part of the unit and to check for comprehension. You are welcome to use the activities that are suggested or create their own with the primary sources.

### Student Materials

Many of the unit instructions are accompanied by a worksheet that can be copied and distributed to students as they analyze the primary source(s) to assist in their application and comprehension. These worksheets are optional but may provide a structure for students to think critically about the primary sources they are analyzing. These reproduceable student worksheets are available in the **student materials PDF** (on website, below "Educator Materials") for this topic.



*Courtesy of the State Historical Society of Iowa, ca. 1945*

### Formative Assessments, Lesson Summative Assessment and Scoring Options

The formative assessments, lesson summative assessment and possible scoring options allow you to evaluate how students comprehend and apply the knowledge they learned from the individual primary source activities. Assessment instructions, example worksheet(s) and possible scoring options are located at the end of this Read Iowa History section. Reproduceable assessment worksheet(s) also are available in this topic's **Student Materials PDF**.

# Iowa's Corn and Agriculture Industry

## 4th Grade

### Overview

Corn has been at the center of Iowa life for much of its existence, and Iowa leads the United States in corn production. The state set a 2016 record with 2.7 billion bushels of corn raised. In addition, the yield in 2018 set an all-time high with an average of 204 bushels per acre. Iowa's incredibly fertile fields stretch for miles of corn and soybeans, providing the United States with two of its most valuable exports. But as farmers are growing more crops and managing more acres, fewer Iowans are making a living as farmers. The number of farms in Iowa is on a steady decline while the average farm size continues to rise. Technology drives increasingly efficient precision farming. This begs the question: Has farming in Iowa shown more continuity or change? In this lesson, students will analyze sources and then write an argumentative essay for a fictitious competition sponsored by the Iowa State Fair board.

### Unit Compelling Question

How does Iowa corn impact Iowans and the world?

### Unit Supporting Question

How has farming in Iowa seen continuity and change?

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# Compelling and Supporting Questions

## 4th Grade

### How to Apply Read Iowa History Lessons to Other Primary Sources

The origin of Read Iowa History lessons stem from the **Primary Source Sets**, which are a collection of primary sources that focus on a topic and are structured under a compelling question and multiple supporting questions (typically three). Five or six primary sources are used to address and help students answer a single supporting question. Read Iowa History takes one supporting question, the primary sources addressing that question and instructions (divided into parts) to integrate these primary sources in the classroom through different activities.

These lessons, instructions, worksheets, tools and assessment suggestions can be applied to all of the K-5 **Primary Source Sets**.

### Unit Compelling Question

The compelling question drives students to discuss, inquire and investigate the topic of a unit of understanding.

**How does Iowa corn impact Iowans and the world?**

### Unit Supporting Questions

Supporting questions scaffold instruction to help students answer the compelling question. Their aim is to stimulate thought, to provoke inquiry and spark more questions. The supporting question that is highlighted above is the question that was used in this Read Iowa History. The **bolded** question below is the supporting question for this Read Iowa History unit.

**1) How has farming in Iowa seen continuity and change?**
2) What impact did John Deere have on farming in Iowa?
3) Where does Iowa corn go and how is it used?
4) What is Iowa Sister States' role in global agricultural opportunities?

### Read Iowa History: Iowa Corn and Agriculture Industry

This Read Iowa History lesson addresses "How does Iowa corn impact Iowans and the world?" and "How has farming in Iowa seen continuity and change?" and includes lesson plans, worksheets, suggested assessments and other tools.

# Standards and Objectives

| Iowa Core Social Studies Standards | |
|---|---|
| **No.** | **Standard** |
| **SS.4.10.** | Describe how societies have changed in the past and continue to change. |
| **SS.4.22.** | Infer the purpose of a primary source and from that the intended audience. |
| **SS.4.26.** | Explain how Iowa's agriculture has changed over time. |

| Iowa Core Literacy Standards | |
|---|---|
| **No.** | **Standard** |
| **RI.4.2** | Determine the main idea of a text and explain how it is supported by key details; summarize the text. |
| **RI.4.3** | Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. |
| **RI.4.6** | Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided. |
| **W.4.1** | Write opinion pieces on topics or texts, supporting a point of view with reasons and information. |
| **W.4.2** | Write informative/explanatory texts to examine a topic and convey ideas and information clearly. |
| **W.4.7** | Conduct short research projects that build knowledge through investigation of different aspects of a topic. |
| **W.4.8** | Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. |
| **SL.4.1** | Engage effectively in a range of collaborative discussions (one–on–one, in groups, and teacher–led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. |
| **SL.4.3** | Identify the reasons and evidence a speaker provides to support particular points. |
| **SL.4.4** | Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. |

## Objectives

- I can analyze sources: images, maps and graphs.
- I can identify and organize evidence that is relevant to the big question.
- I can form a thesis statement as a response to the big question.
- I can orally defend and negotiate my thesis statement and supporting evidence.
- I can write my thesis statement and supporting evidence with accuracy, clarity and relevant details.

# Background Essay

**Utilize this background essay, in whole or in parts, with students to provide further context and understanding about Iowa's corn and agriculture industry. You can read it aloud to students, utilize excerpts and introduce the vocabulary words. The essay is also referenced in parts of this Read Iowa History to assist students in their interpretation and analysis of primary sources.**

Iowa leads the United States in corn production. The state set a record in 2016 with 2.7 billion **bushels**, slightly ahead of 2017 and 2018 levels. In 2018, however, the estimated **yield** set an all-time high at 204 **bushels**. Iowa's incredibly fertile fields of north central Iowa stretch for miles of corn and soybeans, providing the United States with two of their most valuable exports.

Corn has been at the center of Iowa life for almost a thousand years. The ancestors of our modern corn plants first appeared in Central Mexico as a tiny ear wrapped in a tight husk. Through careful cultivation, mostly by American Indian women, the plant eventually evolved into size and shape we know it today. It spread into what is today the American Southwest, along the Gulf Coast and up the Mississippi River and its tributaries until it was a staple of the Upper Midwest and most tribes east of the Mississippi. English colonists first encountered it with the tribes they met on the Atlantic Coast from New England south to Georgia. Corn cultivation had a major impact on the seasonal activities of those who planted it. The year revolved around spring planting and fall harvest, often with the celebration of a successful crop marked with annual festivals. In Iowa pioneer times, farm boys could often attend school only in the winter because their labor was needed at home for planting, cultivation and the fall harvest.

Corn is a giant grass plant and, therefore, easily adapted to the fertile plains of the Iowa prairies. It is incredibly productive as one kernel planted will produce one or two ears with 700+ kernels each. Hybrid varieties developed and spread in the 1920s and 1930s proved so successful that most Iowa farms had adopted them for the end of World War II. Plants grown from hybrids, however, lack the vigor of the parents, creating an annual market and a very profitable hybrid seed industry for the state.

Because corn is bulky, farmers learned early that it is more profitable to feed their corn to livestock, primarily hogs, and then market "the corn" as pork. The **Corn Belt** corn/hogs economy developed in the late 19th century when the railroad lines connected Midwestern farmers with eastern markets. Most of the corn grown in Iowa is what called "field corn." Only one percent of corn planted in the United States is sweet corn. Almost all field corn is used for animal feeds, the production of ethanol as a fuel for automobiles and for manufacturing in products like plastics.

Farm practices have evolved radically since early American Indians and pioneer times. An early technique was to dig a small hole with a hoe and to drop in three to five kernels. Indians often planted beans and squash around the corn to allow the vines to grow up the corn stalks. Weeds were chopped out during the growing season. The labor required kept fields small. The introduction of horse-drawn plows and planters in the mid-19th century allowed one farmer to **cultivate** much larger fields. The mud and clay scoured ("slid off") John Deere's steel plowshare, saving the time the farmer had to stop and remove the sticky soil. With the **tractor** in the early 20th century and the mechanical corn picker, field sizes again took a major leap.

Agriculture has been a major occupation of Iowans and corn has been the most significant product. Iowa is truly a product of this incredible grain.

### Vocabulary Words

- Bushel
- Acre
- Yield
- Cultivate
- Corn Belt
- Tractor
- Combine
- Topsoil
- Global Positioning System (GPS)

# Progress of Farming and Technology

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

## Overview

Students will be introduced to the technology farmers use as they plant, cultivate and harvest corn. They will build historical context for how farming has changed over time. Finally, students will generate and categorize questions to help them organize the information they will gather from future sources.

## Instructions

1. This brief activity is to pique student curiosity and introduce the lesson topic. Tell students that precision farming uses technology to be more efficient with time and resources. Global Positioning System (GPS)-controlled planters, sprayers and combines prevent farmers from overlapping ground, spraying too much (or not enough) chemicals and syncing with grain wagons to transfer harvested grain.

2. Show a brief video of how precision farming uses technology to be more efficient with time and resources. Recommended videos are below:
   - **Farm Basics: GPS in Agriculture**
   - **"How to use GPS and Auto Steering..."** (start at 6:32, end at 7:17)
   - **"Auto Steer"** (start at the beginning, end at 0:56)

3. After watching the videos, ask students: How has today's technology changed farming in Iowa?

4. Students will do a close reading of a secondary source in order to gain background information and essential vocabulary about the topic. Distribute a copy of the **"How Does Iowa Corn Impact Iowans?" background essay** and the **"Build Context and Ask Questions" worksheet** to each student.

5. Do a close reading of the passage.
   - **First reading:** You will read the article aloud without stopping to the class.
   - **Second reading:** Students will read and mark text by underlining important keywords, drawing a question mark next to parts that need clarification and drawing a box around parts that help us answer the main question.
   - **Third reading:** Students will re-read a third time as needed while answering the questions from the worksheet.

*Instructions continued on next page*

## Materials

- **"How Does Iowa Corn Impact Iowans?" background essay**
- **"Build Context and Ask Questions" worksheet**
- **Recommended Videos:** **"How to use GPS and Auto Steering..."** (start at 6:32, end at 7:17); **"Auto Steer"** (start at the beginning, end at 0:56)

# Introducing Change in Farming

## Instructions continued

6. **Literacy connections:** Often, introductory phrases and transition words are used to signal to the reader that an important idea is coming next. A mini-lesson on introductory phrases and/or a mini-lesson on signal words may be important to integrate into this lesson. Question #1 from the **worksheet** asks students to paraphrase the main ideas that come right after the underlined introductory phrases. Note that not all of the introductory phrases were underlined in the text, only the major ones. Question #3 from the **student worksheet** has several of the signal words that show time and are used to compare/contrast farming long ago to today.

7. **Ask Questions:** At the end of this lesson, have students write an essay answering the question, "Has farming in Iowa shown more continuity or change?" Using what they learned in the background essay as a starting point, have students ask and then categorize questions about farming in Iowa.

8. Students independently, and then with a partner, will brainstorm questions. They will then share questions with the class. Be looking for common patterns of the kinds, or topics, of the questions. Record these as possible categories that students will use to categorize information, and thus be the topics of paragraphs, in their final essay.

9. **Formative Assessment:** As students generate questions, listen for the misconceptions that often emerge as students negotiate wording of the questions. Offer information to correct misconceptions that will not be addressed in the remainder of the lesson. It is important to be asking questions throughout this lesson to help in your assessment. Ask about the meanings of words. Ask about general farming practices.

# How Does Iowa Corn Impact Iowans?

Iowa leads the United States in corn production. The state set a record in 2016 with 2.7 billion bushels of corn raised. The yield in 2018 set an all-time high with an average of 204 bushels per acre. Iowa's incredibly fertile fields of north central Iowa stretch for miles of corn and soybeans, providing the United States with two of their most valuable exports.

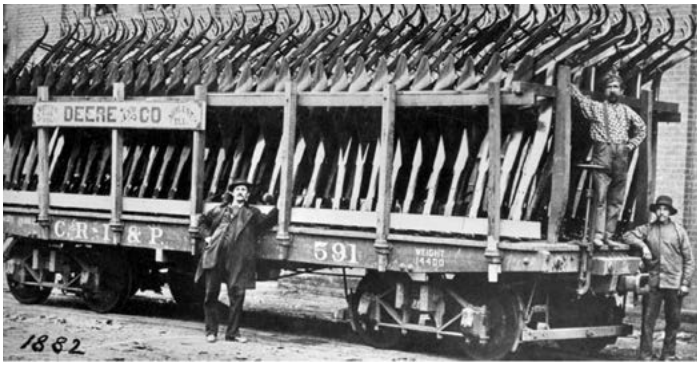
**History of Corn and Iowa**
Corn has been at the center of Iowa life for almost a thousand years. The ancestors of our modern corn plants first appeared in Central Mexico as a tiny ear wrapped in a tight husk. Through careful cultivation, mostly by American Indian women, the plant eventually evolved into the size and shape we know it today.

Long, long ago, growing corn had a major impact on the seasonal activities of those who planted it. The year revolved around spring planting and fall harvest, often with the celebration of a successful crop during annual festivals. In Iowa pioneer times, farm boys could often attend school only in the winter because their labor was needed at home for planting, cultivation, and the fall harvest.

Corn is a giant grass plant and, therefore, easily adapted to the fertile plains of the Iowa prairies. It is incredibly productive as one kernel planted will produce one or two ears with 700+ kernels each.

Because corn is bulky, early farmers learned that it was more profitable to feed their corn to livestock, mostly hogs, and then market "the corn" as pork. In the Corn Belt, the corn/hogs market developed in the late 1800s when the railroad lines connected midwestern farmers with eastern markets.

The labor required kept fields small. The introduction of horse-drawn plows and planters in the mid-1800s allowed one farmer to cultivate much larger fields.




*In the mid-1800s, Iowans worked very hard to produce a corn crop in the thick prairie sod. In Illinois, our neighbor to the east, John Deere was working as a blacksmith when he had an amazing idea. More than 175 years later, the company he started is still an industry leader in new agriculture innovations. Courtesy of John Deere*

With the tractor in the early 20th century and the mechanical corn picker, field sizes again took a major leap. Even with these advances in technology, farming has remained largely a family-owned and operated business.



*At the time of this photo, many farmers used a plow to turn the soil over before they planted the seeds. Turning over the soil with a plow blade broke up the grass roots and made it easier for the corn seeds to sprout. Today, many farmers no longer do this because it can cause the topsoil to wash away. Courtesy of the State Historical Society of Iowa*

**Kinds of Corn in Iowa**
Most of the corn grown in Iowa is "field corn." Only one percent of corn planted in the United States is "sweet corn." Almost all field corn is used for animal feeds, the production of ethanol as a fuel for automobiles, and for manufacturing in products like plastics, cosmetics, and diapers.

If you were to ask Iowans what their favorite season is, many of them would say, "Sweet corn season!" For about five weeks in the mid-summer, many people in Iowa enjoy sweet corn fresh from the field. Even though sweet corn is only about one percent of the corn grown in the United States, it's the corn that most of us are familiar with because we buy it fresh, canned, or frozen from the grocery store.

**Farming Practices Change**
While farming practices have evolved since early American Indians and pioneer times, one of the things that has not changed is the kind of work that happens.

In the spring, farmers prepare the soil and plant the corn seeds. Long ago, many farmers used a plow to turn the soil over before they planted the seeds in order to break up the grass roots and make it easier for the corn seeds to sprout. In the late 1800s, the mud and clay slid off John Deere's newly invented steel plow, saving the time the farmer the time previously spent stopping and removing the sticky soil. Today, most farmers no longer plow their fields because it can cause the topsoil to wash away in the sun, wind, and rain and large equipment can break the crust on the top soil.

# How Does Iowa Corn Impact Iowans?



*A field of sweet corn near Marengo in Iowa County, Iowa, is shown in this photograph by Carol Highsmith. The photo was taken in 2016. Courtesy of Library of Congress*

An early planting technique was to dig a small hole with a hoe and to drop in three to five kernels. Indians often planted beans and squash around the corn to allow the vines to grow up the corn stalks. Today, GPS-guided planters place one seed at a time, in precise rows across the field.

In the early summer, before corn plants are big enough to shade the ground around them and fill in the rows, the farmer has to remove the weeds so that they don't choke out the corn plants. Long, long ago, this was done by hand with a hoe. In the 1940s, farmers cultivated the fields with a cultivator attached to a tractor. Today, many farmers use a chemical to kill weeds.

In the fall, a farmer harvests the mature corn crop and either sells it or stores it to be used or sold later. Early in Iowa's history, corn was harvested by hand and put in a wagon. In the early 1900s, the first mechanical corn pickers were invented, and that made the farmer's harvest much easier. With today's large combines and other equipment, farmers can harvest 150 acres of corn per day. The way corn is harvested is one of the biggest changes in farming over time.

No matter what time of year it is, field work is very dependent on the weather. Wet and muddy fields do not allow for any work in them. In the same way, periods of drought decrease yields. While farmers can adjust growing practices, they cannot control the weather!

Agriculture has been a major occupation of Iowans, and corn has been the most significant product. Iowa is truly a product of this incredible grain.

# How Does Iowa Corn Impact Iowans?

This is an example worksheet that corresponds with the instructions in Part 1 to analyze the farming photos. This version of the worksheet is for you, the educator, to fill out, add notes and utilize. A version of this worksheet is available for reproduction to students in this topic's **Student Materials PDF**.

## Build Context

- **1st reading**: *Teacher reads aloud text.*
- **2nd reading**: *You, the student, will read aloud and mark the text. During the reading, underline vocabulary words and put a question mark (?) next to parts that need clarification. After reading, circle parts that help answer the lesson supporting question.*
- **3rd reading**: *You will re-read as needed in order to find answers these questions that help answer the lesson supporting question.*

1. Authors often signal readers that important ideas are coming up by starting sentences with transition words and introductory phrases. Look for the underlined transition words and introductory phrases in the text. In your own words, list the main ideas that come after them.

2. Write a two or three sentence summary of the "History of Corn and Iowa" section.

3. In the text, highlight the transition words that are at the beginning of a sentence and are used to show how something changed from long ago to today. *Hint: look for words like "long ago," "today" or "in the fall"*

## Ask Questions

*At the end of this lesson, you will answer the question: Has farming in Iowa shown more continuity or change?*

4. What questions will you need to know the answers to in order to answer the lesson supporting question?

# Farming in the 1930s and 1940s

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

## Overview

Students will analyze three images that demonstrate farming in the 1930s and 1940s to investigate what farming was like long ago.

## Source Background

In the 1930s and 1940s, tractors were becoming widely owned and used on Iowa farms. Farmers attached different implements to the tractor to do different jobs such as working up the soil, planting seeds or harvesting mature corn. These machines greatly increased the number of acres a farmer could work themselves, sparing the expense of hiring a large crew of people or putting in the many hours needed to complete the task themselves.

## Instructions

1. Display the **"Farmer Working a Corn Field with a John Deere Tractor"** image. Consider displaying the image on a screen or giving students access to the primary sources via a device.
2. Distribute the **"Analyze a Primary Source" worksheet** to students to complete.
3. Discuss the background information associated with the image, and have students answer the source-dependent questions associated with the primary source.
   - Based on close observation, what season is shown in the image? Why did you make that determination?
   - Compare this image to this **one**. What is different about the beginning of the farming season to the end of the season?
   - What other similarities and differences do you notice between the images?
4. If students are new to analyzing primary source images, consider using the image analysis tool, **"Be An Image Detective!"** Since the goal is to get a general overview of farming long ago, expedite the process by having students talk through the items on the analysis rather than writing down their responses.

*Instructions continued on next page*

## Materials

- **"Analyze a Primary Source" worksheet**
- **"Farmer Working a Corn Field with a John Deere Tractor" image**
- **"Field Workers Harvesting Sweet Corn in Grimes, Iowa" image**
- **"Farmer Operating Corn Picker with John Deere Tractor" image**
- **"Be An Image Detective!" worksheet**
- **Suggested Book:** *John Deere, That's Who!* by Tracy Nelson Maurer

# Farming in the 1930s and 1940s

## Instructions continued

5. Now, students will analyze a primary source with a partner. Using those same steps, students work with a partner to analyze the following two images:
   - **Field Workers Harvesting Sweet Corn in Grimes, Iowa**
     - What technology is helping these workers to do their job?
     - How is this similar to and different from how corn is harvested today?
   - **Farmer Operating Corn Picker with John Deere Tractor**
     - How many people does it take to operate this equipment? How does that impact a farmer financially? Compare this image to **"Field Workers Harvesting Sweet Corn."**
     - How did the inventions that John Deere made impact the farmer in this photograph?

6. **Formative Assessment:** Are students understanding what farming was like long ago? Are they making accurate inferences or are they wildly guessing? What words or concepts confuse them? If the same misconception is heard more than once, it needs to be addressed with the whole class during discussion.

# Farmer Working a Corn Field with a John Deere Tractor, ca. 1945




*Courtesy of the State Historical Society of Iowa, ca. 1945*

# Field Workers Harvesting Sweet Corn in Grimes, Iowa, August 1946



*Courtesy of the State Historical Society of Iowa, Des Moines Register & Tribune, August 1946*

# Farmer Operating Corn Picker with John Deere Tractor, ca. 1945



*Courtesy of the State Historical Society of Iowa, ca. 1945*

# Analyze a Primary Source

This is an example worksheet that corresponds with the instructions in Part 2 to analyze primary sources. This version of the worksheet is for you, the educator, to fill out, add notes and utilize. A version of this worksheet is available for reproduction to students in this topic's **Student Materials PDF**.

## Farmer Working a Corn Field with a John Deere Tractor, ca. 1945

- **This Iowa farmer cultivates his corn field to get rid of weeds that may choke out the corn plants. The spacing of the plants allows for the farmer to cultivate either direction without damaging the corn plants.**

1. What technology is helping this farmer to do his job?

## Field Workers Harvesting Sweet Corn in Grimes, Iowa, August 1946

- **Field workers are harvesting sweet corn for the Beaver Valley Canning Company (later called the Grimes Canning Company) on the farm of Jesse Taylor near Grimes, Iowa.**

1. What technology is helping these workers to do their job?

2. How is this similar to and different from how corn is harvested today?

## Farmer Operating Corn Picker with John Deere Tractor, ca. 1945

- **A farmer drives a John Deere tractor with a corn picker and wagon both attached to the tractor. This corn picker harvests the ear from the plant but does not shell the kernels from the cob. That is another step in the farmer's production before selling the corn.**

1. How many people does it take to operate this equipment? How does that impact a farmer financially? (Hint: Compare to "Field Workers Harvesting Sweet Corn")

2. How did the inventions that John Deere made impact the farmer in this photograph?

# Be an Image Detective!



This is an example "Be an Image Detective" worksheet to help guide students in their analysis of images that are primary sources. This version of the worksheet is for you, the educator, to utilize. A printable version of this worksheet is available in this topic's **Student Materials PDF**.

<table>
<tr><td colspan="2">Title:<br>Who made the image?<br>What year?</td><td>What kind of image is it?<br>___ photo ___ drawing/cartoon<br>___ painting ___ advertisement<br>___ something else</td></tr>
<tr><td>Start with the Basics<br>In one sentence, what is happening in this image?<br><br>Is the image ...<br>____ black & white ____ color<br><br>What does this tell us about when the image was made?<br><br>Is there a caption?<br>____ yes ____ no<br><br>If so, what does the caption tell you?</td><td>Observe ... Look for the Details<br><br>Describe what you see in the image.<br><br>What are the people doing in the image?<br><br>What are the objects used for in the image?</td><td>Put the Pieces Together<br>Where do you think this image takes place? What is its location?<br><br>What evidence tells you that?<br><br>What time period?<br><br>What evidence tells you that?<br><br>Why do you think this image was made?<br><br>How does this image compare to modern times?</td></tr>
<tr><td colspan="3">What questions does this image lead you to ask?</td></tr>
</table>

# Farm Size and Corn Yield Over Time

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

## Overview

Students will analyze a map and a graph to understand how the size of an average farm and the number of farms in Iowa have changed in the last 80 years.

## Source Background

Farmers are growing more crops and managing more acres, but fewer people are making a living as farmers. In the last 80 years, the number of farms in Iowa has dramatically decreased as the population moves to more urban areas or live on acreages but do not have their primary occupation as farming. The average size of each farm also has dramatically increased, but the number of people farming has significantly decreased. Just like the size and number of farms is changing, so is the productivity of each acre of land.

**Source 1:** In 1933, the State Planning Board of Iowa, a special committee that only existed from 1934 to 1939 to study long-term land use plans for the state, published this map showing the average farm size measured in number of acres. They also showed if the land was used for cash grain cops and/or livestock.

**Source 2:** This graph looks at the number of farms compared to the average farm size in Iowa from 1950 to 2014.

**Source 3:** Each year, the United States Department of Agriculture (USDA) publishes many statistics telling what happened in agriculture that year. One of those statistics is the average corn yield. They add together all of the bushels of corn harvested in that county and then divide by the number of acres of corn planted in the county to calculate an average for the county. The USDA publishes this information every year.

**Source 4:** This USDA map shows the average bushels of corn produced per acre by county. Many variables impact the corn crop yield, such as weather and soil conditions. The top of the map reads that the state average is 196.0 bushels per acre in 2018.

## Instructions

1. Display the primary source, **"Average Farm Size in Iowa Map."** Consider displaying the map on a screen or giving students access to the images. Give students an opportunity to "read" the map and determine meaning.

2. Discuss the map as a class.
   - Which district has the largest average farm size in Iowa? Explain how you know which district that is.
   - After analyzing the next source, compare them. Look at the map, **"Number of Farms and Average Farm Size, Iowa: 1950-2014."** How did the size of Iowa farms change from 1932 to 1950?

*Instructions continued on next page*

## Materials

- **"Average Farm Size in Iowa Map"**
- **"Corn Yield Map of Iowa"**
- **"Corn for Grain Yield Map of Iowa"**

# Farm Size and Corn Yield Over Time

## Instructions continued

3. Have students work independently or with a partner to answer the questions on **Analyze a Primary Source worksheet**. Discuss answers as a whole class.

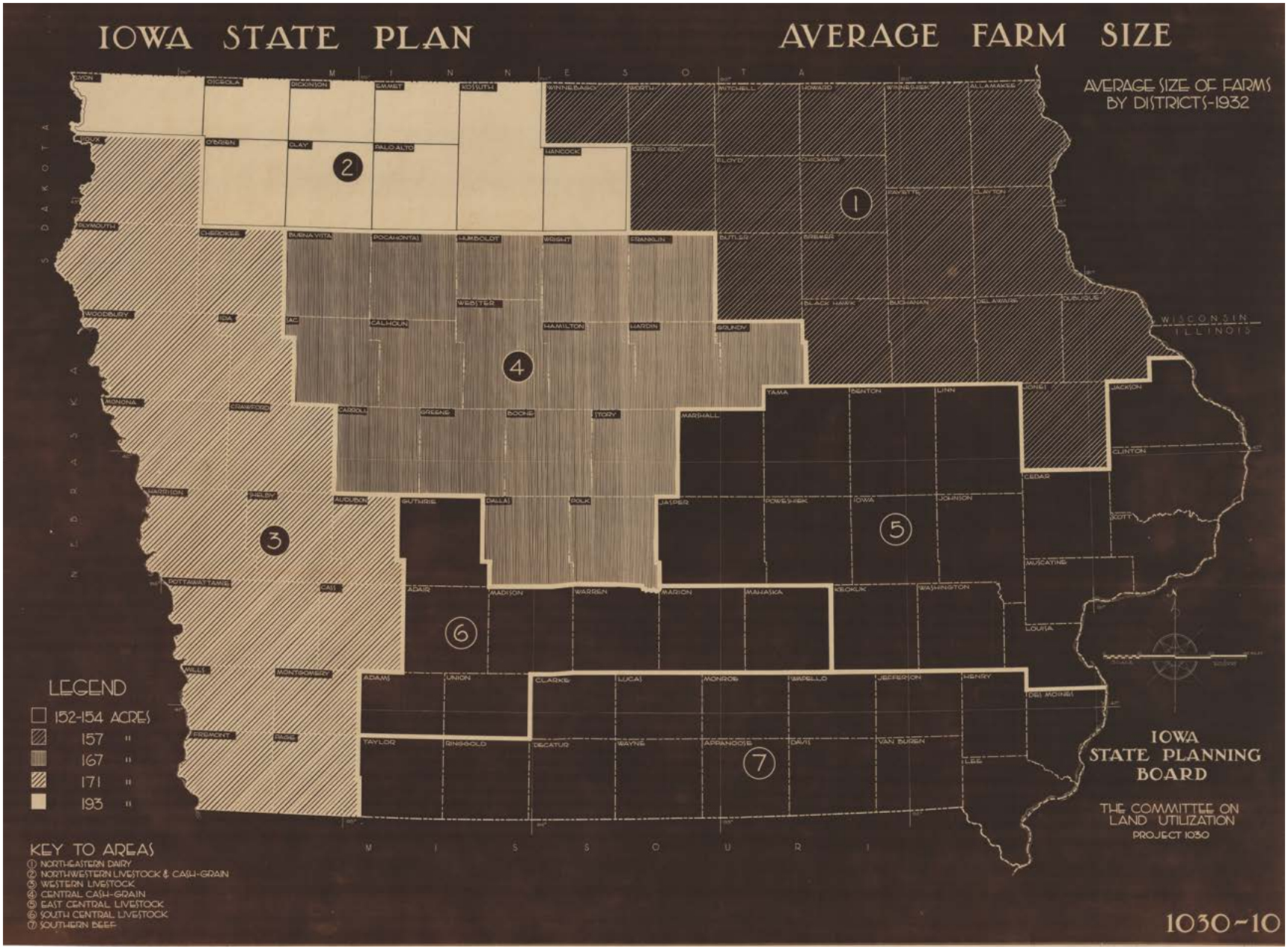
4. Student will repeat steps one to three of this activity for the following primary sources to complete their analysis:
   - **Number of Farms and Average Farm Size in Iowa from 1950 to 2014**
   - **Corn Yield Map of Iowa, 1933**
   - **Corn for Grain Yield Map of Iowa, 2018**

5. **Formative Assessment:** Observe as students work. Are students analyzing the sources accurately? Are they using the map legend as they discuss and answer questions? The **"Number of Farms and Average Farm Size" graph** is difficult to understand. Ask students to summarize the graph by asking the question, "What's the author's message in this graph?"

## More Materials

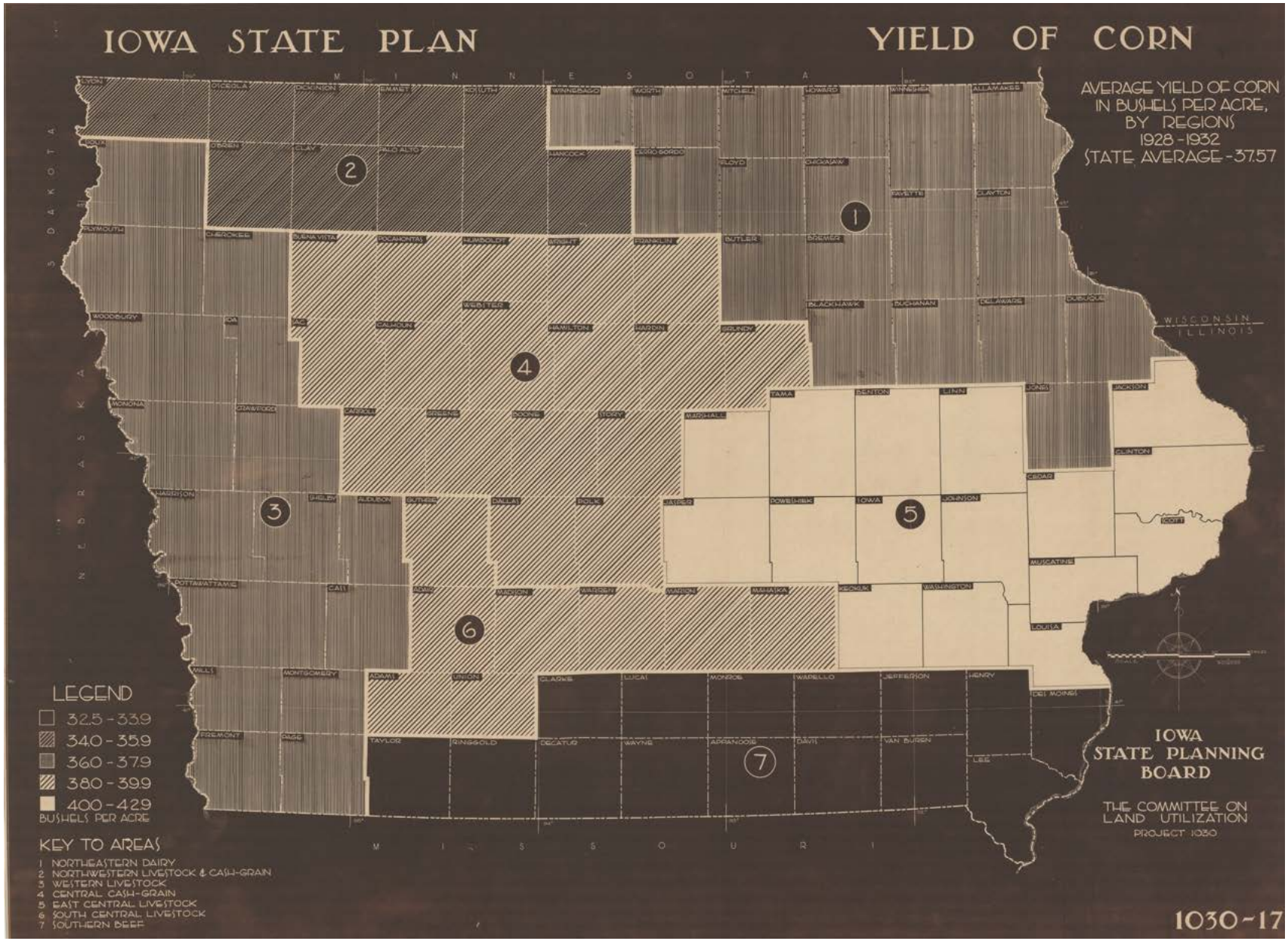
- **"Number of Farms and Average Farm Size in Iowa from 1950 to 2014"**
- **Analyze a Primary Source worksheet**

# Average Farm Size in Iowa Map, 1933



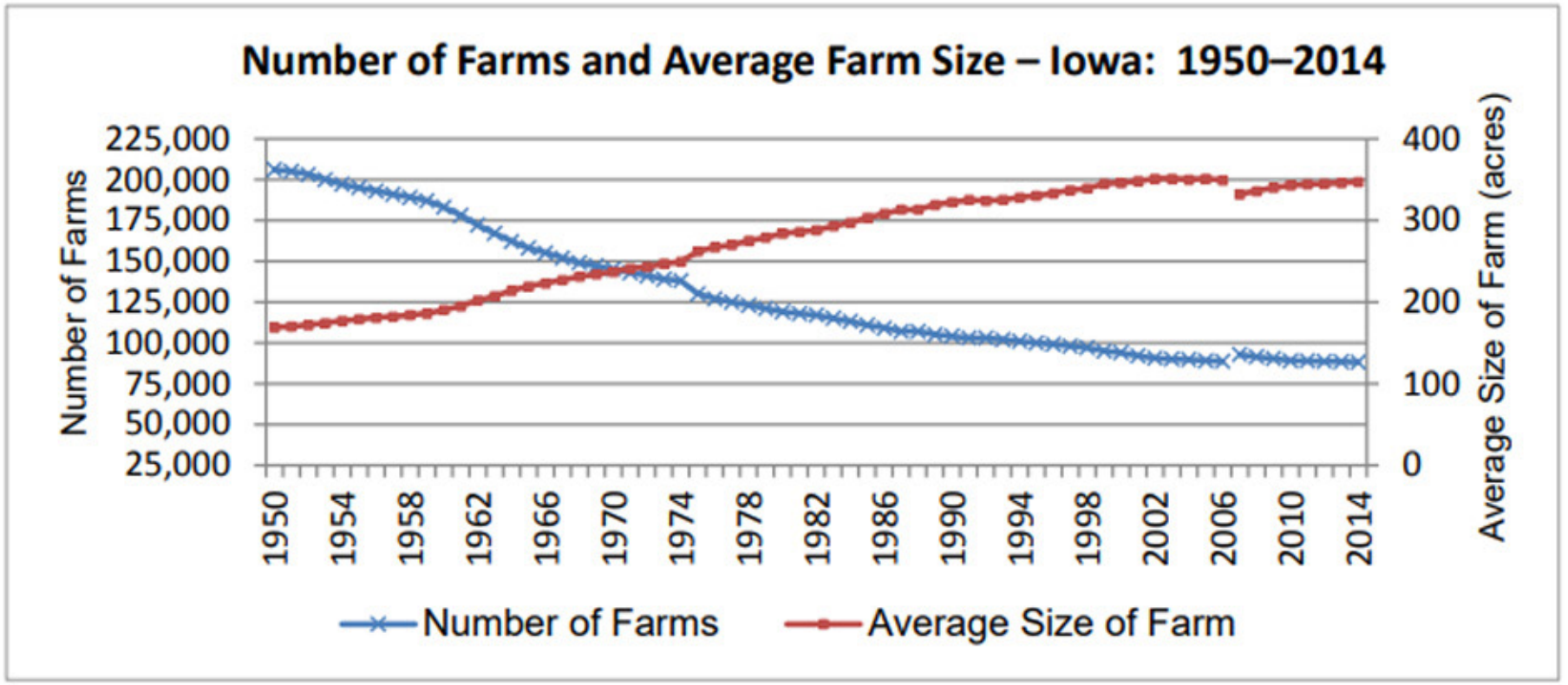

*Courtesy of University of Iowa Library and Archives, "Average farm size: average size of farms by district, 1932," Iowa State Planning Board, 1933*

# Corn Yield Map of Iowa, 1933



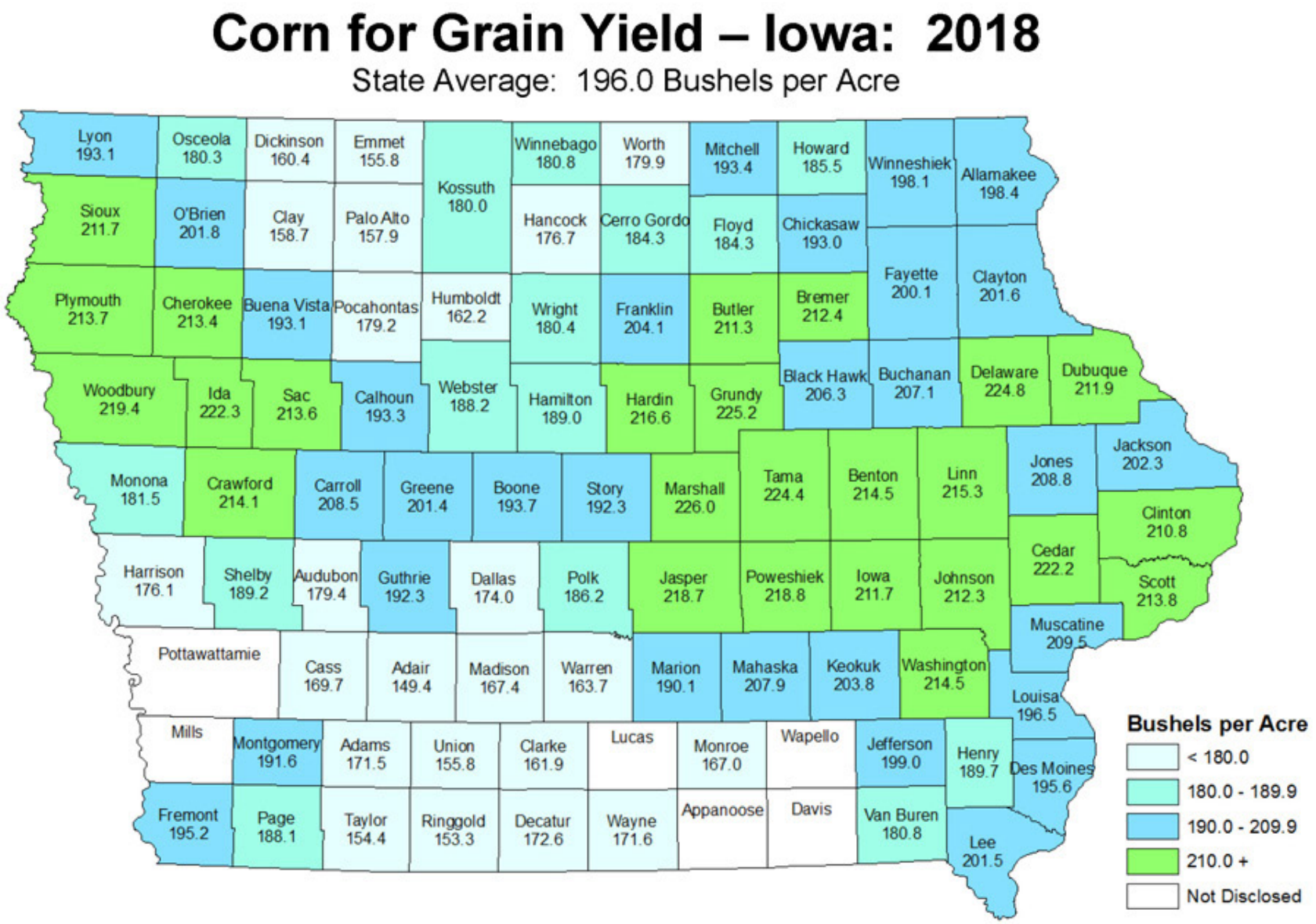

*Courtesy of University of Iowa Library and Archives, "Yield of corn: average yield of corn in bushels per acre, by region 1928-1932: state average 37.57," Iowa State Planning Board, 1933*

# Number of Farms and Average Farm Size in Iowa from 1950 to 2014, 2015




*Courtesy of USDA, "Number of Farms and Average Farm Size - Iowa: 1950-2014," pp. 10, Iowa Agricultural Statistics Bulletin, National Agricultural Statistics Service, United States Department of Agriculture (USDA), 2015*

# Corn for Grain Yield Map of Iowa, 2018




*Courtesy of USDA, "Corn for Grain Yield – Iowa: 2018," National Agricultural Statistics Service, United States Department of Agriculture (USDA), 2018*

# Analyze a Primary Source

This is an example worksheet that corresponds with the instructions in Part 3 to analyze primary sources. This version of the worksheet is for you, the educator, to fill out, add notes and utilize. A version of this worksheet is available for reproduction to students in this topic's **Student Materials PDF**.

## Average Farm Size in Iowa Map, 1933

**In 1933, the State Planning Board of Iowa, a special committee that only existed from 1934-1939 to study long-term land use plans for the state, published this map showing the average farm size measured in number of acres.**

1. Which district has the largest average farm size In Iowa? District Number _____

   Which district has the smallest average farm size In Iowa? District Number _____

2. What's the range of average farm size in Iowa in 1932? _____ to _____ acres per farm
   *(Hint: ranges are written with the smallest number first and the largest number second)*

## Number of Farms and Average Farm Size in Iowa from 1950 to 2014, 2015

**This graph looks at the number of farms compared to the average farm size in Iowa from 1950 to 2014.**

1. When the same measurement is taken over a period of time and graphed, a trend line forms. Which direction is the trend line going for the number of farms in Iowa from 1950 to 2014?

2. Which direction is the trend line going for the average size of a farm in Iowa from 1950 to 2014?

3. Write one sentence summarizing "Average Farm Size in Iowa Map" and "Number of Farms and Average Farm Size in Iowa." Include the words: number of farms, average size of farms.

   _____

   _____

   _____

# Analyze a Primary Source

## Corn Yield Map of Iowa, 1933

**Each year the United States Department of Agriculture publishes many statistics telling what happened in agriculture that year. One of those statistics is the average corn yield. They add together all of the bushels of corn harvested in that county and then divide by the number of acres of corn planted in the county to calculate an average for the county. For this publication, they show the average yield for a group of counties, called a region.**

1. Which district has the largest average yield in Iowa? District Number _____

   Which district has the smallest average yield in Iowa? District Number _____

2. What was the statewide average corn yield from 1928-1932?

## Corn for Grain Yield Map of Iowa, 2018

**Published by the United States Department of Agriculture, this map shows the average bushels of corn produced per acre by county. Keep in mind that many variables impact the corn crop yield such as weather and soil conditions.**

1. What was the statewide average corn yield from 2018?

2. How does this statewide average corn yield compare with the statewide average yield in 1928-1932?

**Challenge Question:** 2018 was a drought year for some parts of Iowa. Use evidence from the map to predict which parts of Iowa received less rain and hotter temperatures.

Write one sentence summarizing the "Corn Yield Map of Iowa" and the "Corn for Grain Yield Map of Iowa." Include the words: yield, increase/decrease.

_____

_____

_____

# My Family's Corn Farm, Feb. 13, 2017

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

## Overview

Students will read the eBook **My Family's Corn Farm** by Kate Olthoff to gain understanding into life on a present-day family farm in Iowa. They also will use a worksheet to analyze the text.

## Source Background

This text, available **digitally** or ordered at very minimal cost from the Iowa Agriculture Literacy Foundation, chronicles Presley and her farm family in southern Iowa as they go through a season of growing corn.

## Instructions

1. Students will independently read through the text the first time.
2. Now, display the text, reading the student portion of the text (the larger font on the white background) as well as the adult text (the smaller font on the blue background).
3. Have students answer the questions on the **Analyze a Source worksheet**. Discuss their answers as a whole class.
4. **Optional Resource:** Use **"The Commodity Chain of Corn" story map** (2017). This resource is an excellent visual representation of information on global corn production, sweet corn production, subsidies, ethanol, livestock feed, corn in food and U.S. corn exports.
5. **Formative Assessment:** Observe as students answer the questions in the worksheet to assess their understanding.

## Materials

- **My Family's Corn Farm** by Kate Olthoff (eBook)
- **Analyze a Source worksheet**
- **Optional Resource: "The Commodity Chain of Corn" story map**

# Analyze a Source

This is an example worksheet that corresponds with the instructions in Part 4 to analyze a source. This version of the worksheet is for you, the educator, to fill out, add notes and utilize. A version of this worksheet is available for reproduction to students in this topic's **Student Materials PDF**.

## ***My Family's Corn Farm*** **by Kate Olthoff**

Iowa Agriculture Literacy Foundation, 2017

1. What is grown or raised on Presley's family's farm?

2. How is corn grown by Presley's family used?

3. How is Presley's family involved in the farm?

4. In Presley's grandparents and great-grandparents time, what was used to plant and harvest corn?

5. What does Presley's family use to plant and harvest corn? How are they helpful?

6. Complete the following sentences using these words:

*ears, water, harvest, nutrients, roots, spring, combine, plant, grow, dried*

In the _____, farmers _____ seeds in rows. The small corn plants sprout, and the _____ grow down into the soil to gather _____ and _____. In the summer, the corn plants _____ taller and taller, and then they grow the _____ of corn. When the corn plant is fully grown and the kernels are _____ out, it's time to _____ the corn. The farmer uses a _____ to remove the ears from the stocks and take off the kernels.

17. How many uses for corn exist today? List a few of them.

# Gathering and Evaluating Evidence

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

### Overview

Students will evaluate the evidence they have collected as they analyzed sources and answered the questions that went with them. They will finalize the category labels, organize evidence and discuss what they found. Think of this step as the open forum where students discuss and test out their ideas before they write their essay

## Instructions

### Materials

- "Gathering Evidence" worksheet

1. Take students back to the "Asking Questions" section from Part 1. Review the categories the class brainstormed. After analyzing these primary sources, do any of those categories make sense to talk about when answering the question: How has farming in Iowa seen continuity and change?
2. Distribute the "Gathering Evidence" worksheet to students to complete. Complete the first category together. Write "growing cycle" in the first category box.
3. Have students talk with a partner about what they think has changed about the growing cycle and what has stayed the same. They should conclude that the growing cycle hasn't changed over time. If not, help them to reach that conclusion. In the "Continuity" box on the worksheet, write "cultivate > plant > weed > harvest," "depends on weather" and "hard work." Nothing is written in the "Change" section since these things have remained consistent.
4. Students will choose the categories they want to talk about in their essay. Students can independently select and record evidence from the answers to the questions along with their own background knowledge and/or source analysis beyond the questions listed in this lesson. As needed, provide the hint that the answers to questions to their past "Analyze a Primary Source" worksheets contain key ideas.
5. Students will then present, defend, clarify and discuss evidence. Students will decide if they think farming has shown more continuity or more change since the 1930s. Divide them into three groups: more continuity, more change and undecided. Students will physically move to separate areas of the classroom.
6. Within their group, give students time to discuss why they picked that thesis. The undecided group should focus on what they want to clarify or what questions they have.
7. Start the conversation by asking one group to tell the evidence they used to support their answer. Then move on to other groups to tell theirs.

*Instructions continued on next page*

# Gathering and Evaluating Evidence

## Instructions continued

8. Ask the undecided group if anyone wants to move to a group based on what they heard (have them tell why they are moving before/as they physically relocate to the other group).

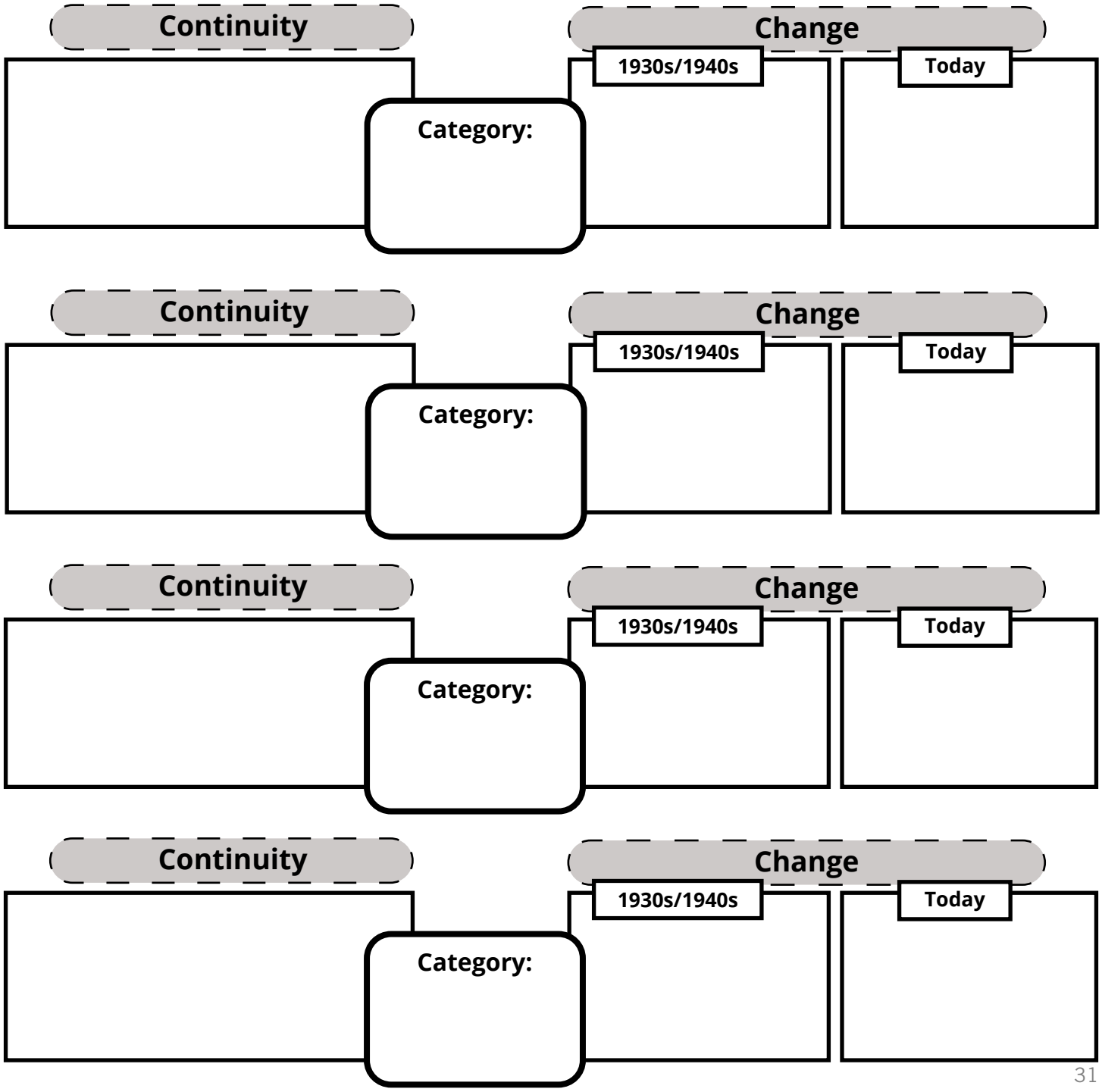
9. Open up the discussion for questions, clarification, and negotiation of thinking. Don't skip this step! It gives students a chance to test out their ideas before they write about them in the essay, even for those students who remain quiet the majority of the time. Their internal negotiation is key to solidifying understanding

10. **Formative Assessment:** Observe as students negotiate, clarifying as needed.

# Gathering Evidence

This is an example gathering evidence worksheet that corresponds with the instructions for Part 5. This blank version of the worksheet is for you, the educator, to fill out, add notes and utilize. A printable version of this worksheet is available for reproduction in this topic's **Student Materials PDF**.

## Gathering Evidence



# Lesson Summative Assessment

## Unit Compelling Question

How does Iowa corn impact Iowans and the world?

## Unit Supporting Question

How has farming in Iowa seen continuity and change?

## Assessment Instructions

1. It is now time for students to assemble their evidence into an essay. The good news is that they have already been putting it together throughout the lesson as they have answered the questions.

2. Distribute **lesson summative assessment worksheet**. Give students plenty of time to write. Students are welcome to go back to the sources and the answers to their questions as they write.

3. **Language Arts Connections**
   - Hook Sentences: designed to introduce the topic, get the reader's attention, and make them want to read more
   - Thesis: statement clearly taking a position on and answering the big question, the "answer"
   - Evidence: fact or information the author uses to support their thesis, the "fact"
   - Reasoning: how the evidence connects to the thesis, the "why"

4. For students who do not want to be confined by the lines in the worksheet, they can write on notebook paper or even type their essay. Have them keep the worksheet nearby in order to consider the prompts that are in each section.

5. If possible, have students put the essay away for a couple of days. Then take it back out for revision and editing before turning in the final essay.

## Assessment Scoring Options

| | |
|---|---|
| **Proficient** | Student shows understanding of the continuity and changes in farming, answers are accurate |
| **Developing** | Mixture of some accurate and some inaccurate parts |
| **Beginning** | Student unable to write any ideas in the given time and/or ideas are very inaccurate |

# Lesson Summative Assessment

This is an example gathering evidence worksheet that corresponds with the instructions for the lesson summative assessment. This blank version of the worksheet is for you, the educator, to fill out, add notes and utilize. A printable version of this worksheet is available for reproduction in this topic's **Student Materials PDF**.

## Lesson Summative Assessment

**Scenario:** The Iowa State Fair board is sponsoring a new competition this year. They have invited fourth graders to write an essay about farming in Iowa. Twenty-five winners will record their essay and be part of an interactive display in the Agriculture Building next August. Answer the following question for your chance to win. Good luck!

**How has farming in Iowa seen continuity and change?**

| | |
|---|---|
| **Introduction**<br>• Start with a hook sentence.<br>• Write the context in a sentence or two.<br>• Write the big question in your own words in a statement.<br>• Write your thesis (answer) in one sentence.<br>• **Refer to your answer to question 2 in Part 1.** | |
| **Category 1**<br>_____<br>• Start with topic sentence (introduces category)<br>• Supporting Evidence<br>• Reasoning (how evidence connects to thesis) | |

# Lesson Summative Assessment

| | |
|---|---|
| **Category 2**<br>_____<br>• Start with topic sentence (introduces category)<br>• Supporting Evidence<br>• Reasoning (how evidence connects to thesis) | |
| **Category 3** *(if needed)*<br>_____<br>• Start with topic sentence (introduces category)<br>• Supporting Evidence<br>• Reasoning (how evidence connects to thesis) | |
| **Conclusion**<br>• Restate thesis in a new way<br>• Give a clincher - a final, convincing thought to leave with the reader | |

# Iowa's Corn and Agriculture Industry

## Acre

An acre is a common measurement for land. It is equal to 43,560 square feet, which is about the size of an average football field.

## Bushel

A bushel is a common measurement for grain. A bushel typically weighs about 70 pounds.

## Combine

A combine is a machine used to cut a mature plant, such as corn, and thresh the grain from the chaff, such as corn kernels from the husk.

## Corn Belt

The Corn Belt is an area of the United States that includes all of Iowa and Illinois, along with some parts of Indiana, Minnesota, South Dakota, Nebraska, Kansas, Missouri and Ohio. It is called the Corn Belt because it is a region of the Midwest since the 1850s that has dominated corn production in the United States.

## Cultivate

To cultivate is to prepare land for the raising of crops, such as tilling or plowing the ground.

## Global Positioning System (GPS)

The Global Positioning System is a space-based satellite navigation system that provides location and time information anywhere on the Earth.

## Topsoil

Topsoil is a thin layer of surface soil where most plants grow. This is the layer of soil that a farmer turns over while plowing.

## Tractor

A tractor is a machine with a very powerful engine used to slowly pull things along, usually farm equipment.

## Yield

Yield is the full amount of an agricultural or industrial product that was produced.

# Additional Resources for Educators

**Iowa Corn and Agriculture Industry Primary Source Set**
This Read Iowa History unit is based on this digital collection of primary and secondary sources. The source set focuses on the continuity and change of farming in Iowa and the impact of the state's agriculture industry, especially corn, on the national and global economy.

***John Deere, That's Who!*** by Tracy Nelson Maurer
This illustrated story book reflects on the life and legacy of John Deere, who was a pioneer of modern-day farming equipment.

***Sweet Corn and Sushi*** by Lori Erickson
This book tells the story of how Iowa and Yamanashi became sister states.

***The Boy Who Changed the World*** by Andy Andrews
This book tells the story of how Norman Borlaug saved the lives of two billion people but would not have gotten to that point without the very important actions of other people.

**"The Commodity Chain of Corn" Story Map**
This interactive webpage is a visual representation of information on global corn production, sweet corn production, subsidies, ethanol, livestock feed, corn in food and U.S. corn exports.

**Iowa Corn: Exports**
This video focuses on the supply and demand of Iowa corn.

**A Tale of Two Corns**
This two-page handout is from the National Corn Growers Association and it shows how corn from used in 2017.