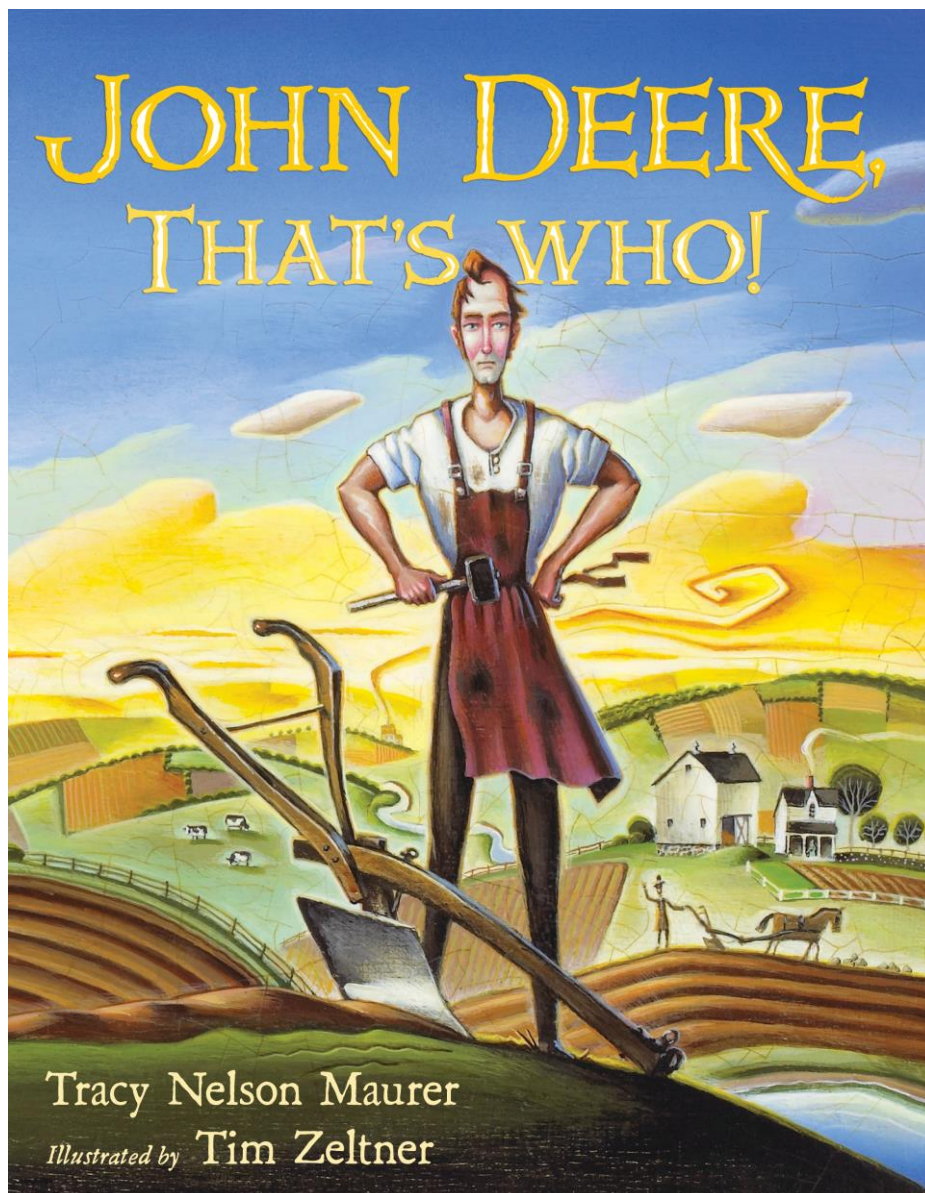


 **Indiana Farm Bureau®**
2018 Book of the Year



Educator Guide

Indiana Agriculture in the Classroom
An educational outreach program of Indiana Farm Bureau, Inc.

www.inaitc.org



What is Indiana Agriculture in the Classroom?

Agriculture in the Classroom is a grassroots agricultural outreach program for school children in grades Pre-K through 12, facilitated by Indiana Farm Bureau and coordinated nationwide by the United States Department of Agriculture. This program helps kids understand where the food they eat is grown and how important farmers are to their daily lives.

Each year, registered volunteers all across Indiana visit classrooms to teach more than 60,000 students about agriculture through in-class lessons, hands-on activities, educational events, on-farm experiences and field trips.

The Indiana Agriculture in the Classroom program offers standards-based lessons and materials, many free of charge, to schools, community groups and other non-profit organizations that wish to integrate agriculture into their curriculum.

Our Mission

To increase agricultural literacy through K-12 education.

Our Vision:

Agriculture is valued by all.

We believe:

- Increased understanding of agriculture allows individuals to make informed choices about nutrition and health for themselves and family.
- Informed citizens will be able to participate in establishing the policies that will support a competitive agricultural industry in this country and abroad. (agday.org)
- Beginning in pre-kindergarten and continuing through 12th grade, all students should receive some standards-based education about farming and agriculture outside of agricultural education courses.
- Agricultural literacy includes an understanding of agriculture's history and current economic, social and environmental significance to all Americans. This understanding includes some knowledge of food and fiber production, processing and domestic and international marketing. (agday.org)

Book of the Year Ag Literacy Program

Program Purpose:

To increase understanding, build awareness and develop a positive public perception of Indiana agriculture through education.

Student Goals:

- Understand how food, fiber and renewable resource products are produced and by whom.
- Realize that science plays an important role in our food supply and that the scientific advancements in food production are safe, proven and necessary.
- Acknowledge and consider career opportunities in the agriculture, food, fiber and renewable resource industries. (agday.org)

What is Agricultural Literacy?

A person who understands and can communicate the source and value of agriculture as it affects our quality of life. (National Agricultural Literacy Logic Model, 2013)

The Importance of Ag Literacy

- An increased knowledge of agriculture and nutrition allows individuals to make informed personal choices about diet and health.
- Informed citizens will be able to participate in establishing the policies that will support a competitive agricultural industry in this country and abroad.
- Agriculture is too important a topic to be taught only to the small percentage of students considering careers in agriculture and pursuing vocational agricultural studies.
- Agricultural literacy includes an understanding of historical and current economic, social and environmental issues that affect all Americans. This understanding includes being knowledgeable about food and fiber production, processing and domestic and international marketing. Employment opportunities abound in agriculture. Career choices include:
 - Farm production
 - Agribusiness management and marketing
 - Agricultural research and engineering
 - Food science
 - Banking
 - Processing and retailing
 - Education
 - Landscape architecture
 - Urban planning
 - Energy
 - And other fields.



John Deere, That's Who!
Meet the author- Tracy Nelson Maurer

Tracy Nelson Maurer grew up outside of Superior, Wisconsin where she spent hours playing in the woods. Living in the country helped forge her lifelong love for quiet places, books, gardens and writing.

Tracy has researched and written more than 100 informational books, ranging from pre-kindergarten A-B-C books to middle/upper-grade hi-low titles on crafts, sports cars, extreme sports, cheerleading and other fun topics. Her picture-book biography *John Deere, That's Who!* (Henry Holt, 2017) was named a Junior Library Guild Selection and received the first Frances and Kermit Rudolf Nonfiction Scholarship Award from Hamline University. Another nonfiction title, *Noah Webster's Fighting Words* (Millbrook Press, an imprint of Lerner Publishing, 2017) received the Nonfiction Work-in-Progress Grant from the Society of Children's Book Writers and Illustrators. Her picture book *Storm Codes* won the Northeastern Minnesota Book Award Children's Literature Honor in addition to other recognition. Her nonfiction books for schools and libraries have received favorable reviews from Booklist, ALA and VOYA; some served as examples in Models for "Teaching Writing-Craft Target Skills" by writing expert Marcia S. Freeman (Maupin House, 2005).

A professional writer for more than 25 years, Tracy also develops, writes and edits for business publications and websites, as well as marketing and advertising materials. She has led workshops and writing groups, and served as the writing mentor for the Minnesota chapter of the Society of Children's Book Writers and Illustrators. She's also been a guest presenter at special events, workshops, schools and libraries throughout Minnesota and as far as Nebraska, Colorado, and California. Tracy holds an MFA in writing for children and young adults from Hamline University and lives near Minneapolis, Minnesota with her family

For more information about Tracy Nelson Maurer visit www.tracymaurewriter.com.

Indiana Academic Standards

Kindergarten	1 st grade	2 nd Grade	3 rd Grade	4 th grade
Science and Computer Science				
<p>K-2.E.1 Pose questions, make observations and obtain information about a situation people want to change. Use this data to define a simple problem that can be solved through the construction of a new or improved object or tool.</p>	<p>1.ESS.2 Observe and compare properties of sand, clay, silt and organic matter. Look for evidence of sand, clay, silt and organic matter as components of soil samples.</p>	<p>K-2.E.1 Pose questions, make observations and obtain information about a situation people want to change. Use this data to define a simple problem that can be solved through the construction of a new or improved object or tool.</p>	<p>3-5.E.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time or cost.</p>	<p>3-5.E.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time or cost.</p>
	<p>1.ESS.3 Observe a variety of soil samples and describe in words and pictures the soil properties in terms of color, particle size and shape, texture, and recognizable living and nonliving items.</p> <p>K-2.E.1, K-2.E.2</p>			
<p>K-2.E.2 Develop a simple sketch, drawing or physical model to illustrate and investigate how the shape of an object helps it function as needed to solve an identified problem.</p>	<p>K-2.E.2 Develop a simple sketch, drawing or physical model to illustrate and investigate how the shape of an object helps it function as needed to solve an identified problem.</p>	<p>3-5.E.2 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>	<p>3-5.E.2 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>	
Social Studies				
<p>Standard 1 — History Students examine the connections of their own environment with the past, begin to distinguish between events and people of the past and the present, and use a sense of time in classroom planning and participation.</p>	<p>Standard 1 — History Students identify continuity and change in the different environments around them, including school and neighborhood communities, and identify individuals, events and symbols that are important to our country.</p>	<p>Standard 1 — History Students differentiate between events that happened in the past and recently, recognize examples of continuity and change in local and regional communities, and consider ways that people and events of the past and present influence their lives.</p>	<p>Standard 1 — History Students describe how significant people, events and developments have shaped their own community and region; compare their community to other communities in the region in other times and places; and use a variety of resources to gather information about the past.</p>	<p>Standard 1 — History Students trace the historical periods, places, people, events and movements that have led to the development of Indiana as a state.</p>
				<p>Standard 3 — Geography Students explain how the Earth/sun relationship influences the climate of Indiana; identify the components of Earth's physical systems; describe the major physical and cultural characteristics of Indiana; provide examples of how people have adapted to and modified their environment, past and present; identify regions of Indiana and compare the geographic characteristics of Indiana with states and regions in other parts of the world.</p>
<p>K.4.2 Economics Identify and describe different kinds of jobs that people do and the tools or equipment used in these jobs.</p>	<p>Standard 4 — Economics Students explain how people in the school and community use goods and services and make choices as both producers and consumers.</p>	<p>Physical Systems 2.3.5 On a map, identify physical features of the local community. Example: Use maps and atlases to identify local bodies of water, crops and green spaces.</p>	<p>Standard 3 — Geography Identify the distinctive physical and cultural features of their community, explain the geographic relationships between their own community and the state and other states within the region, and compare the geographic characteristics of their own community with communities in other parts of the world.</p>	

Glossary

Source: National Agriculture in the Classroom Curriculum Matrix.

agriculture: the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.

career: an occupation undertaken for a significant period of a person's life and with opportunities for progress; generally a profession requiring special training

commodity: a raw material or primary agricultural product that is bought and sold on a large scale

crops: plants that farmers grow for fuel and fiber, such as corn or soybeans

farmer: a person who grows crops or raises livestock as a job

farming: the production of food and fiber derived from plants and animals. Farmers must understand economics, business, mathematics, and the science involved in getting their crops and animals to market. The science involved in agriculture includes the knowledge of ecosystems, soil, water, weather, chemistry, and plant and animal biology.

Also see the Glossary found in *John Deere That's Who!* that includes the following terms:

- calico
- debt
- forge
- smithy
- steel
- till

Discussion Questions

1. The story begins with “Back in John Deere’s day...” which was the 1830s. Describe what life might have been like “back in John Deere’s day.”
 - What were common jobs people had? What type of technologies did they have? Not have? Where did they get food for their family?
2. John Deere was born in Vermont but traveled to Illinois to start a blacksmith business. What states would he have possibly traveled through on his journey?
3. What is a forge? What does it do? What materials and supplies might have John needed to build one?
4. What is soil? Why were the farmers having such a difficult time with “the soil the farmers called gumbo?”
5. Why was the plow such an important tool for farmers? What are other important tools and equipment farmers use?
6. Discuss what might be some innovations in technology that help farmers today. Encourage students to think outside the box beyond just new tractors and harvesters. Have them consider how things such as the internet and GPS might influence farmers, as well as mobile apps. (Source [NC State University](#))

John Deere, That's Who! **Inventor's Challenges**

Adapted from Wisconsin AITC

Inventors identify problems or challenges and then work to find solutions to those problems. In the process, they may have to deal with a variety of challenges. As you think about John Deere's story, fill in this chart with a 2-3-sentence answer to the question.

What problems did John Deere identify?	What trial and error solutions did John Deere attempt to fix these problems?	What sacrifices did John Deere have to make?
Name three places that John Deere lived.	Identify three terms that related to farm equipment and define them.	What were some of the things the farmers were struggling with?

John Deere, That's Who! How did he do it?

Adapted from Wisconsin AITC

What did he observe?	
What questions did he ask?	
What predictions did he make?	
What plan did he develop?	
How did he record or use the results?	
How did he draw a conclusion or finalize his end product?	

Are you the next John Deere?

Adapted from Wisconsin AITC

Wouldn't it be fun and exciting to be an inventor or discover something that make a difference for many? Fill out this chart to help you discover how you might invent or discover something that will benefit others?

What is a problem or challenge that you'd like to discover a solution to? It could be a new piece of equipment or new technology that would help solve a problem or challenge?

Where will you learn more about the problem? What types of solutions will it take? Types of machines or technology will you need?

How will you raise money to build and test prototypes and experiment?

Who else might help you as you work to solve this problem or design this new invention?

Where will you do this? At home? A lab? On a farm? In a shop or factory?

How will you test it? Are there steps that need to be done once you have designed a new machine or technology?

How will you advertise or promote this new invention? Who will you introduce it to first? Who might be the first users?

Any legal steps you might take?

Dirt Play Dough Sensory Activity & Recipe

Source: <https://frugalfun4boys.com/2017/01/18/how-to-make-dirt-play-dough/>

In the book *John Deere, That's Who!*, the farmers in Illinois had problems with the soil, called Gumbo, sticking to their plows. It took a lot of time to plow a field because they had to stop often to remove the sticky, gummy soil. Ideal soil contains equal amounts of sand, silt and clay. Gumbo is mostly clay.

- Read: [The science behind sticky gumbo soil](#)
- Published Soil Surveys in Indiana [USDA-NRCS](#) provides detailed information about each Indiana county's soil and terrain.

Have students create "Dirt Play Dough" or a similar sticky clay-like product to touch and feel while they think about the challenges of trying to dig through such a rubbery, sticky, gummy substance.

Ingredients:

1 cup flour
½ cup salt
1 tablespoon cream of tartar
1 tablespoon vegetable oil
1 cup water
Brown food coloring (Wilton gel recommended)
Disposable gloves for kneading in food coloring
Clean play sand

Directions:

1. Stir the flour, salt and cream of a tartar.
2. Mix in the water and oil.
3. Heat the mixture over medium heat in a non-stick skillet, stirring often until it forms a ball.
4. Let the play dough cool on the counter before coloring. Knead in brown food coloring to desired color. Knead in sand - adding ¼ cup of sand at a time until you are happy with the consistency.

Related Lessons and Activities

Search the National Agriculture in the Classroom Curriculum Matrix for these great resources at www.agclassroom.org/teacher/matrix/ or click on the title of each if viewing online.

John Deere, That's Who!

Back in the 1830s, who was a young blacksmith from Vermont, about to make his mark on American history? John Deere, that's who! This illustrated biography tells the story of John Deere and his contributions to agriculture. Learn how John Deere invented a steel plow and changed farming forever.

- View the book in its entirety, including illustrations on issuu.com

[Machines and People](#) The purpose of this activity is for students to define the word "machine" and understand how machines are used in agriculture to produce food and fiber. They will observe a variety of machines and compare and contrast them.

[Machines in Agriculture](#) The purpose of this activity is for students to make connections between the six types of simple machines and the complex machinery used to produce food and fiber.

[It's a Moo-stery!](#) Students will make observations and learn about historic tools used on a dairy farm to store and process milk into cheese and butter.

[Made to Move](#) The purpose of this activity is for students to use simple machines to examine the relationships between force and motion. Students will complete a science journal and participate in group activities demonstrating the use of simple machines.

[Six Kinds Do It All](#) The purpose of this lesson is for students to become familiar with the six kinds of simple machines—the inclined plane, pulley, screw, wedge, lever and wheel and axle. These machines are combined to form complex machines.

[Technology in Agriculture](#) The Special Collections Research Center Teacher Resources at North Carolina State University has compiled a brief list of technologies in agriculture that have impacted farming in the late 20th century.

[Try Engineering: Planting with Precision](#) Lesson explores agricultural and engineering. Students learn about equipment and consider the impact these inventions have had on farming and agriculture over the years.

Suggested Reading & Companion Resources

Big Book of Big Tractors by Lisa Jane Gillespie

Big Book of Big Tractors is a large, full color book that gets even bigger with its fold out pages. Students will learn the names of many machines and implements used on the farms that grow and harvest their food. How do machines dig in the soil and plant seeds? What kind of tools make physical labor on a farm easier by lifting heavy objects or performing the work of many people? How do machines harvest grains, hay, cotton and other agricultural products? How are tractors and large machines used off the farm? These questions and more are answered and can serve as a companion to lessons about machines, harvesting and engineering (STEM).

Machines on the Farm by Sian Smith

Providing an early introduction to STEM education, this book uses simple text and labeled photographs to examine a wide range of exciting machines used on the farm, revealing how each machine solves a particular problem. Machines covered include tractors, combine harvesters, milking machines, hay balers, crop sprayers and more!

Planters and Cultivators: with Casey and Friends by Holly Dufek

Planters and Cultivators introduces children to the world of modern farming and the specialized equipment that is used on the farm for cultivating, planting and spraying crops. This book is filled with colorful action photographs, fun illustrations and a cast of cartoon equipment characters. As a companion to lessons about soil composition and soil nutrients, students will learn why and when these tools are used to manage and improve crop health and growth.

[Tractor Timeline - A History of Tractors](#) (multimedia)

Use this interactive tractor timeline to learn about the history of tractors. Dive into the history of tractor development and see how the evolution of these farm implements has changed how we farm and made it possible to increase our crop yields.

[The History of the Tractor](#) (multimedia)

How much thought have you given to the great American tractor? If you have food on your table, you have the tractor to thank for it. This website outlines the history and timeline of the tractor and how it has revolutionized farming.

[USDA-NRCS Unlock the Secrets in the Soil](#) (multimedia) Provides Indiana Soil Data dating back more than 100 years. Site includes links to maps, descriptions and videos about soil.