

A photograph of a green tractor with yellow wheels and a blue trailer attached, driving through a field of harvested crops. A grain cart is visible in the background. The sky is blue with some clouds.

Agricultural STEM Careers and Lessons
that Engage Student Learning

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Welcome!

My Agricultural Experience





Agricultural Literacy as defined by the National Research Council - 1988

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, and 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)

Today we will look at these topics:

Why include agriculture
in your after school
programs?

**STEM Careers in
Agricultural**

Where can I find
resources?



**Why include agriculture in
your program?**



We have to bring children into a new relationship to food that connects them to culture and agriculture.

Alice Waters



Why teach about agriculture?

We are a nation that has reaped the benefits of a successful agricultural system. This allowed our society to flourish, engage in leisure activities, and dream about future endeavors. Our successful innovations concerning food and fiber has resulted in fewer farmers and larger yields. However, this success story has come with a consequence of a society that has little understanding concerning agricultural production and processing, and how this system meets our basic needs (food, clothing, shelter), and relates or interacts with a sustainable environment and our quality of life. Daily decisions made by individuals through dollars and voting, affect our agricultural system from soil to spoon. If U.S. agriculture is going to continue to meet the needs of the U.S. population and address growing global needs, agriculture needs to be understood and valued by all.

<https://www.agclassroom.org/get/doc/NALObooklet.pdf>



Why Teach about Agriculture STEM Careers?

“If you’ve never considered careers in agriculture because you think they are available only in rural areas and farming just isn’t for you, think again. A report issued in 2015 by the U.S. Department of Agriculture projects that skilled agriculture-related jobs, requiring specific training and secondary education, will number almost 58,000 through 2020. These are expected to be well-paying jobs, according to the report, and are very important as the United States works to develop solutions to feed more than 9 billion people by 2050.” www.stemjobs.com



<http://www.journey2050.com/>

Journey 2050 - <http://www.journey2050.com/>

How will we sustainably feed over 9 billion people by the year 2050?

“Journey 2050 takes students on a virtual farm simulation that explores world food sustainability. Using an inquiry based approach the program encourages students to make decisions and adjust them as they see their impact on society, the environment and the economy at a local and global scale. The students experience the lives of three farm families in Kenya, India, and Canada. As the student interacts with each family they learn the role of best management practices in feeding the world, reducing environmental impacts and in improving social performance through greater access to education, medical care and community infrastructure. Our Journey to feeding the world has started.

“<http://www.journey2050.com/>

Resource

Offers Free Lessons

Educators do not need an agricultural background.

Lesson 1: Introduction to Sustainable Agriculture (90 min) •
Lesson 2: Plant Health (45 min) •
Lesson 3: Water (45 min) •
Lesson 4: Economy (45 min) •
Lesson 5: Land Use (45 min) •
Lesson 6: Careers for 2050 and Beyond! (45 min) •
Summary (45 min)



Additional 2050 Resources

National Geographic:
The Future of Food

<https://www.nationalgeographic.com/foodfeatures/feeding-9-billion/>

National Ag in the Classroom

www.agclassroom.org

Lesson Plan: Journey 2050

Lesson 1: Introduction to
Sustainable Agriculture
(Grades 6-8)

Nexus

<https://agwaternexus.com/2050-food-crisis/>



Farmers 2050 Game

[Apple Store](#)
[Google Play](#)

Resources:

- Free Farming Game
- Create and manage your own farm sustainable farm.
- Experience Farming on a whole new level.



STEM Careers in Agriculture



Agriculture: Growing Opportunities Free Ebook

What it is:

This book contains a wide variety of information about available careers in agriculture.

Where to find it:

Alabama Farmers Federation ALFA website:

www.alfafarmers.org

http://alfafarmers.org/uploads/files/Ag_Careers_Booklet.pdf

Go to: Programs
Click: For Schools
Click: Resources



Google Exhibitions

This free app works with Google Classroom.

Take students on a 3D Career Exhibition.

Career Exhibition: Young Stock Worker, Heather
Bowie - Milk Farm



My American Farm

www.myamericanfarm.org

‘My American Farm focuses on connecting students to a wide variety of careers in the agricultural industry.’

www.myamericanfarm.org

“My American Farm (www.myamericanfarm.org) offers free downloadable lessons, interactive educational games, and agricultural activities to enrich your curriculum. All lessons are aligned to national learning standards. One of the newest updates to the My American Farm site, My Little Ag Me, connects students to different agricultural careers within nine career focus areas. There are many great ways My American Farm, especially My Little Ag Me, can be integrated into your school.”

www.myamericanfarm.org



www.myamericanfarm.org

“Lesson plans and activity sheets can be found at: www.myamericanfarm.org/classroom to use alongside the interactive educational games to further students’ learning.”

www.myamericanfarm.org



National AG in the Classroom

www.agclassroom.org

Click: Student Center

Click: Career Seeker

These choices are available:

Agcareers.com

“Search for a career in realtime! What are the position opening right now? Where are they located? What are the educational requirements? How much does that job pay? AgCareers.com works to build the pipeline of talent to the industry by expanding knowledge about the breadth of career opportunities in agriculture.”

Careers in Agriculture Videos

“This collection of 40 short videos highlights a wide variety of careers in agriculture and natural resources. Each video is one to four minutes long and features an interview with a professional working in an agricultural field.”

Ag Explorer:

“On this site explore the broad range of careers in agriculture.”

See Yourself In an Agriculture Career:

“This online Prezi presentation explores agricultural careers organized by career pathways—check it out and consider the possibilities!”

Finding Careers in AgroWorld

“Check out the stories in AgroWorld and consider all the career possibilities related to these stories!”

Designs that Matter: Agriculture Engineering

“Learn how agricultural engineers apply engineering technology and science to help farmers be more productive, reduce environmental impacts, and keep our food affordable, safe, healthy and delicious.”



AgCareers.com

www.AgCareers.com

“A great career starts with the right education. AgCareers.com features hundreds of colleges, universities and agriculture schools in the United States and Canada that offer courses, certificates, diplomas and degrees that will help you land your dream job in the agriculture industry.”

www.AgCareers.com

This website has lists of careers, colleges, statistics, etc. that can be used for research.



STEM Jobs

www.STEMjobs.com

This website has portals for students, educators, and partners. It is for more than just agriculture.

For Agricultural careers:

Search: Agriculture

You will be taken to:

Incredible STEM Careers in Agriculture

<https://stemjobs.com/incredible-stem-careers-in-agriculture/>

Students can take the STEM Type Quiz

Go to the Student Portal.

Click: STEM Type Quiz.
<https://stemjobs.com/student-type-quiz-main/>



STEM Career Lab

<http://stemcareerlab.org>

“Explore! Watch! And Learn!

Through this collection of videos, hear from STEM professionals about their educational pathway, what it is they love about their jobs, and how they really do use that math and science they learned in high school. Start exploring now!”

<http://stemcareerlab.org/>

This website offers:

- Student videos
- Teacher Background Videos
- Resources
- Viewing Guides
- Lessons
- Activities

Links to a few articles relating to STEM and Agriculture:

- *Why You Should Pursue a STEM Career in Agriculture?* Jamie Wisniewski www.ecnmag.com
- *Smart Agriculture: Using intelligent system to improve ag~~old~~ farming techniques* Eurekalert! www.ecnmag.com
- *How Sensors are Changing the World of Greenhouse Growing* Kasey Penetta www.ecnmag.com
- *STEM Skills a Necessity for 27 Percent of New Agriculture Jobs* Andrew Soergel www.usnews.com



Where can I find resources?

Teach Engineering - www.teachengineering.org

FREE K12 Curriculum What's the difference between "TeachEngineering lessons, activities, units, sprinkles and maker challenges?

As you browse and search the collection, notice our five curriculum types:lessons, activities, units, sprinkles, and maker challenges. You can use the search filter to limit your searches to one or more of these document types.

Lessons provide students (and educators) with the content knowledge to successfully work through the lessons' corresponding activities. Because TeachEngineering is focused on delivering hands-on, engineering curricula, no standalone lessons are permitted in the collection. Each lesson has at least one associated activity that gives students the opportunity to apply their knowledge and cement comprehension.

Activities give students a chance to move beyond worksheets and pencils for a more tangible learning experience.

TeachEngineering activities often have a design focus so students experience the full or partial engineering design process—a powerful way to generate solutions for any problem. Students gain knowledge through active, projectbased learning, rather than from a book, lecture or worksheet. While many activities are standalone, others pair with supporting lessons.

Units are cohesive collections of lessons and activities designed to be taught together. Each unit describes the suggested order to teach the associated lessons and activities. Those lessons and activities are also designed to be conducted on their own, separate from the bigger unit context. Not all lessons and activities are part of a unit, so we indicate any dependencies to other TE documents.

Sprinkles are abbreviated versions of our most popular activities, giving educators the opportunity to engage students in hands-on engineering in informal learning environments. These “taste of engineering” activities are perfect for before or afterschool clubs! Most Sprinkles take 60 minutes or less to conduct and are designed for quick prep by teachers and nonteachers. We provide them in Spanish, too!

Maker Challenges support the makerspace revolution that is taking the K-12 STEM teaching and learning world by storm! Maker Challenges are teacherprompted, open-ended project ideas and problems for students to solve in a selfdirected, thinking-with-their-hands way that is guided by the design cycle steps. These projects cultivate everyday thinking routines and engineering habits of mind.”

California Foundation for Agriculture in the Classroom

[www.LearnAboutAg.org](http://www.learnaboutag.org)

Steer Toward STEM: Careers in Animal Agriculture

“This five-lesson unit for grades 3-5 promotes the development of STEM abilities and critical thinking skills, while fostering an appreciation for the people involved in livestock production. The curriculum includes real-life challenges for students to investigate, inquiry-based labs, and opportunities to plan and construct models. Featured careers include animal physiologist, agricultural engineer, range manager, animal nutritionist, and animal geneticist.” <http://www.learnaboutag.org/>

From "STEM" to Plate: Careers in Food Science

“This four-lesson unit for grades 6-8 promotes the development of STEM abilities and critical thinking skills, while fostering an appreciation for the people involved in food production. The curriculum includes inquiry-based labs, real life challenges for students to investigate, and opportunities to plan and construct products and shipping models. Featured careers include food scientist, food packaging specialist, food transportation specialist, and food safety specialist.”

<http://www.learnaboutag.org/>

California Foundation for Agriculture in the Classroom - Continued

[www.LearnAboutAg.org](http://www.learnaboutag.org/)

STEM Connections, Energy and Agriculture: Careers in Sustainable Energy

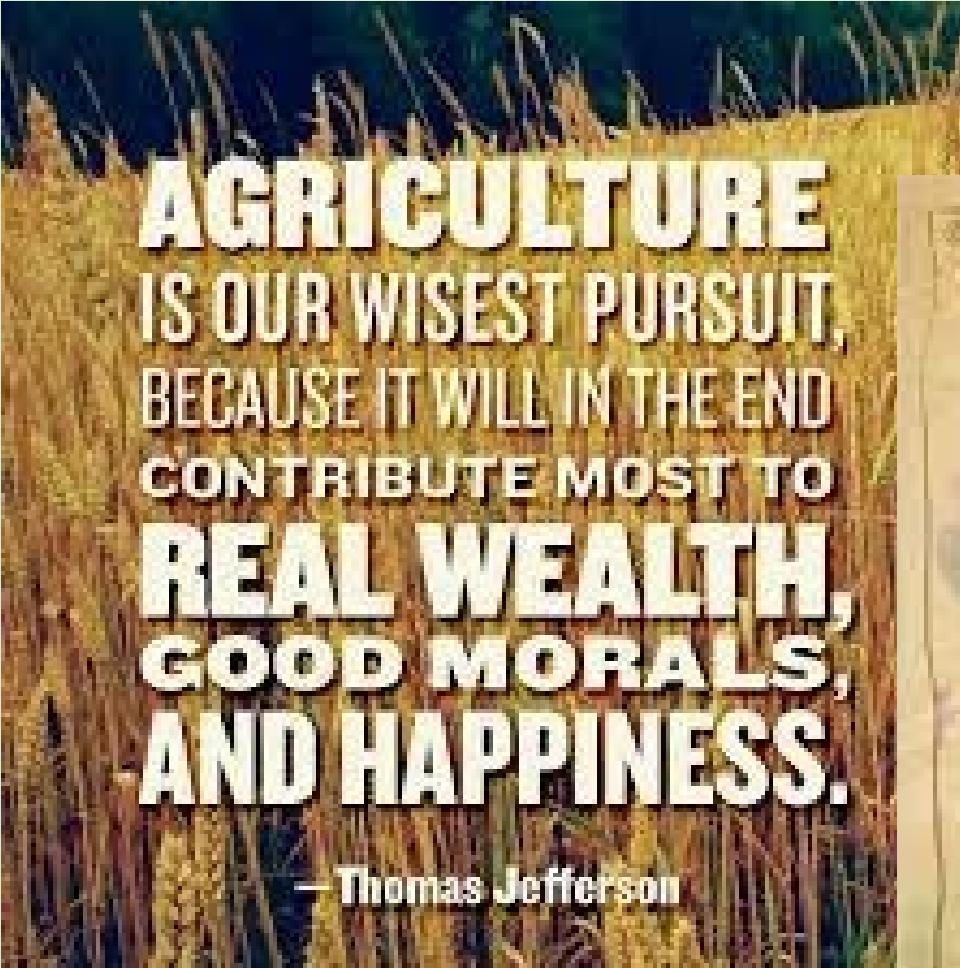
“This five lesson unit with a laboratory for grades 9-12 promotes the development of STEM abilities and critical thinking skills, while fostering an appreciation for energy and its importance to food production. The new curriculum includes inquiry-based labs and real life challenges for students to understand energy sources and their implications.”

<http://www.learnaboutag.org/>

These resources are all free downloads.



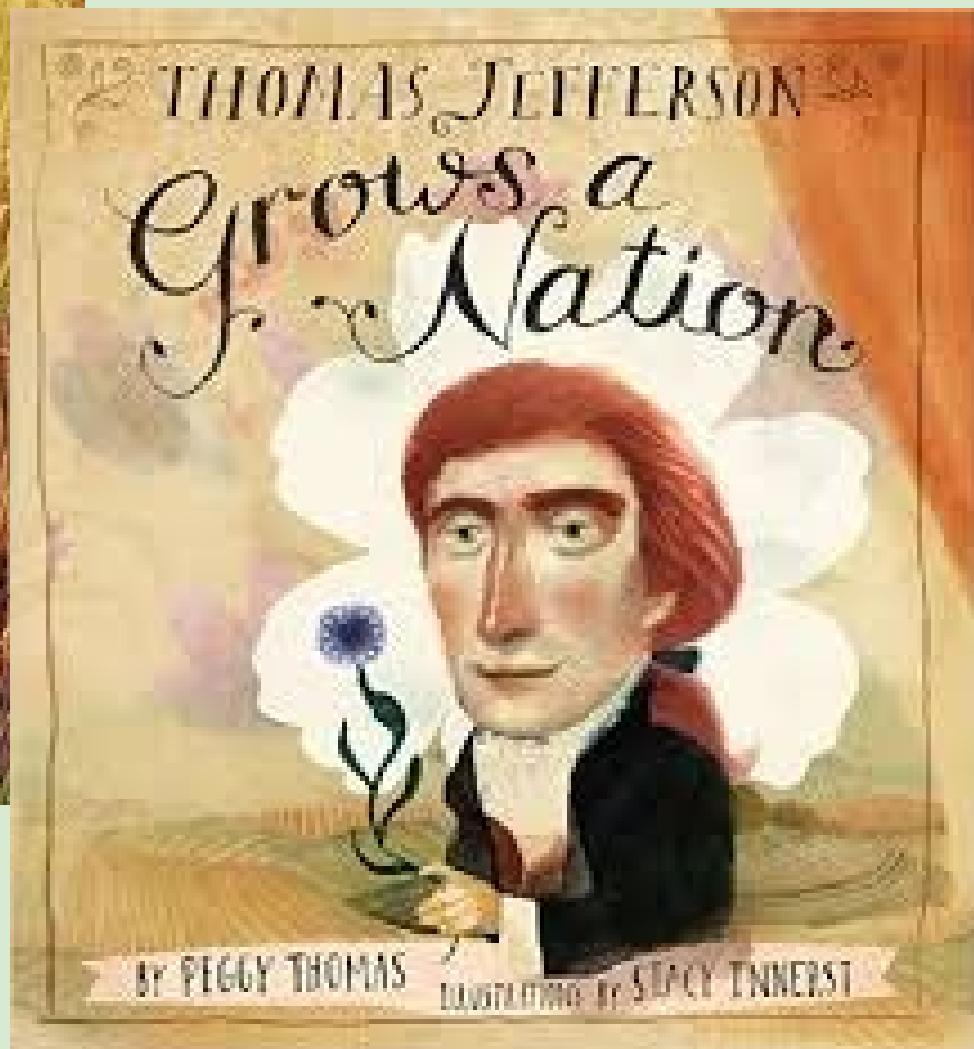
Literature Resources



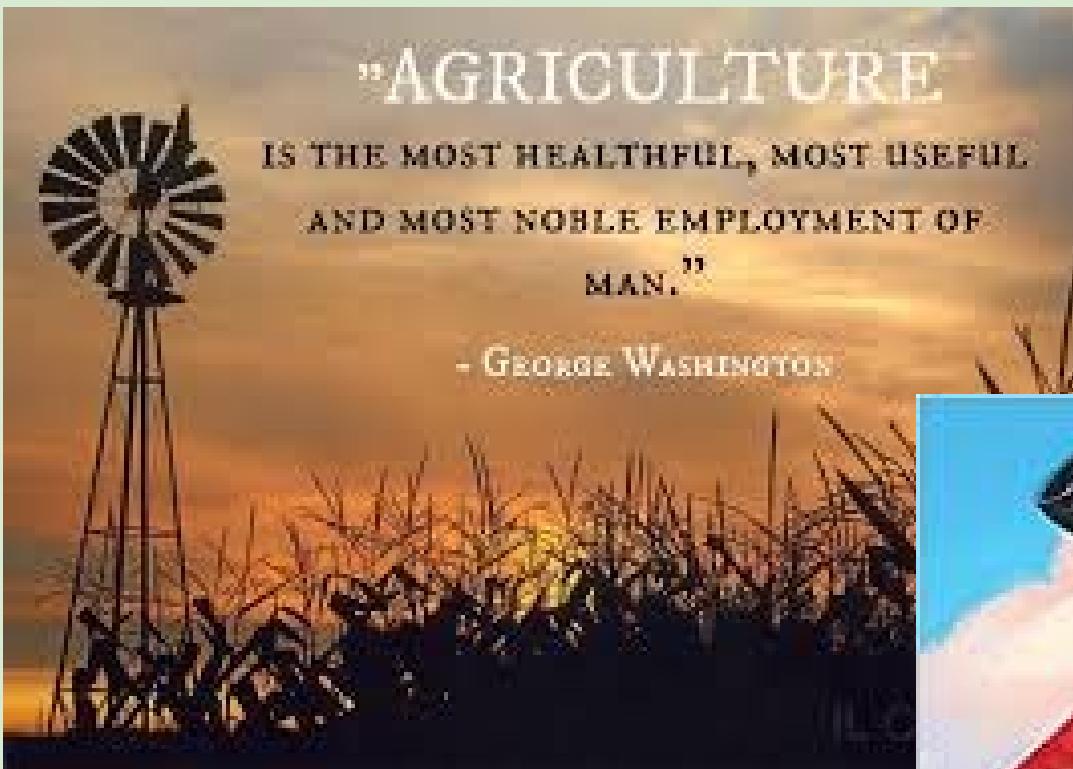
**AGRICULTURE
IS OUR WISEST PURSUIT,
BECAUSE IT WILL IN THE END
CONTRIBUTE MOST TO
REAL WEALTH,
GOOD MORALS,
AND HAPPINESS.**

— Thomas Jefferson

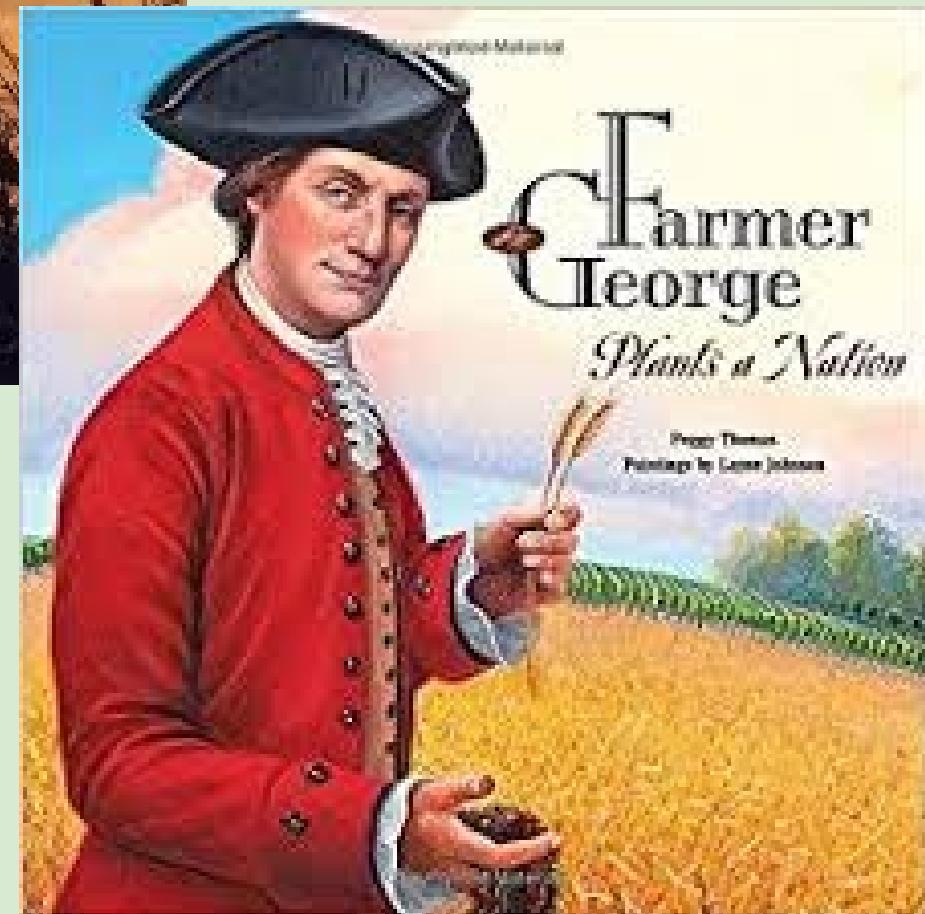
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<http://www.slj.com/2015/09/reviews/books/thomas-jefferson-grows-a-nation-by-peggy-thomas-slj-review/>



- GEORGE WASHINGTON

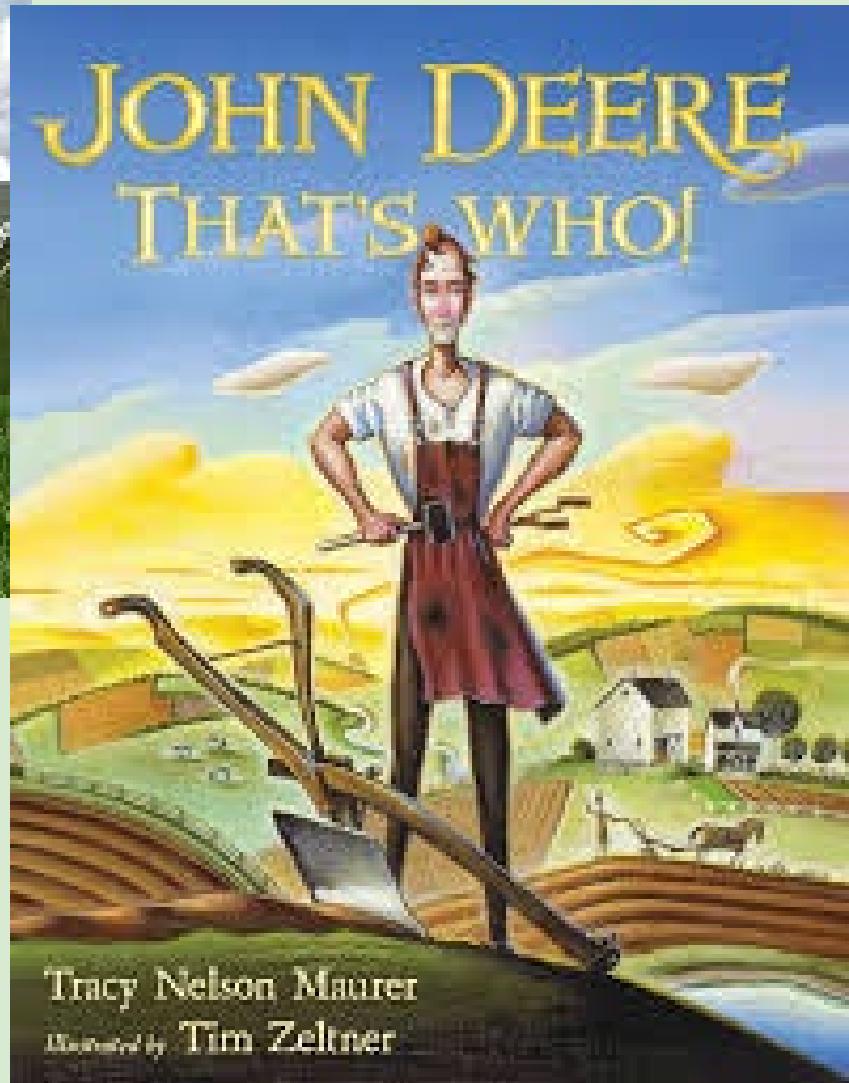


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<https://www.amazon.com/Farmer-George-Plants-Nation-Thomas/dp/1620910292>



<http://randyfrazier.com/john-deere-quote/>



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Resources



National Ag in the Classroom - Free Resources

www.agclassroom.org

The Curriculum MATRIX

“The National Agricultural Literacy Curriculum Matrix is an online, searchable, and standards-based curriculum map for K-12 teachers. The Matrix contextualizes national education standards in science, social studies, and nutrition education with relevant instructional resources linked to Common Core Standards. Search our instructional, classroom-ready resources now! After you find what you need, consider storing them in your personal binder —MyBinder!”

- State Agricultural Facts:
 - Click on any state to see state facts including
- Links to State Affiliates
- Links to Conference Information
- Links for grants
- Free Screensavers
- Games
- Websites
- Videos



Alabama Ag in the Classroom - Free Resources

www.alabamaitc.org

Summer Institute

Every summer you can apply to attend the state level Ag in the Classroom Summer Institute.

“The workshop will include integrated agricultural activities for grades K-6 and field trips to active farms. Participants will receive Professional Development hours as well as innovative materials and teaching strategies that increase student knowledge of the nutritional and economic importance of the food and fiber systems in their daily lives. Activities incorporate language arts, science, social studies, and mathematics skills.”

Resources

- Links to agricultural resources
- Mini Grants
- Awards
- National Conference Info



American Farm Bureau Foundation for Agriculture - Free Resources

<http://www.agfoundation.org/free - resources/>



<http://www.agfoundation.org/free-resources/>

Resource:

When I Grow UP: Discovering Ag Careers

108 Page Curriculum

Grades 6-8

http://www.agfoundation.org/files/Career_Kit_Guide_Web.pdf

My American Farm - Free Resources

<http://myamericanfarm.org/>



Resources:

- Online Games
<http://myamericanfarm.org/classroom/games>
- Lesson Plans
http://myamericanfarm.org/classroom/lesson_plans
- Activity Sheets
http://myamericanfarm.org/classroom/activity_sheets
- eComics
<http://myamericanfarm.org/classroom/eomics>
- Videos
<http://myamericanfarm.org/classroom/videos>



<http://myamericanfarm.org/>

Lessons:

- Be A Farmer: Math in Action
<http://www.myamericanfarm.org/activities/MathInAction.pdf>
- Who Knew? Careers in Agriculture
http://www.myamericanfarm.org/lessons/who_knew_careers_lesson.pdf
- Amazing Ag Careers eComic
http://www.myamericanfarm.org/files/1Page_Amazing_Ag_Careers_eComic.pdf
- Beef After School Resource Kit
<http://www.myamericanfarm.org/files/BeefAfterSchoolResources.pdf>



Kidsgardening.org - Free Resources

Website:

<https://kidsgardening.org/>

"We create opportunities for kids to learn through gardening, engaging their natural curiosity and wonder by providing inspiration, community know-how and resources."



<http://kidsgardening.org>

Resources:

- Grants
- Carton 2 Garden STEM Project
- Gardening Activities
- Growing Guidelines



AgExplorer - Discovery Education Free Resources

www.agexplorer.com

Resources:

- Free Virtual Field Trips
- Educator Resources which include implementation guides, classroom activities, and virtual field trip guides

Resource

A few topic examples:

- STEM Careers Improving Animal Health
Brought to you by Zoetis & AgExplorer
- Technology in Agriculture: Feeding the Growing Globe
Brought to you by Syngenta & AgExplorer
- The Science Behind Your Food
Brought to you by Cargill & AgExplorer



Not Really AG, but Awesome!

Visit NASA Education on the Web:

- ★ NASA Education:

<http://www.nasa.gov/education>

- ★ For Educators:

<http://www.nasa.gov/audience/foreducators/index.html>

- ★ For Students:

<http://www.nasa.gov/audience/forstudents/index.html>

- ★ NASA Kids' Club:

<http://www.nasa.gov/kidsclub>



STEM/STEAM Activity!!

http://www.agfoundation.org/files/Career_Kit_Guide_Web.pdf

YOU are going to be a packaging engineer for the day!

You will need to work in groups of 5-6 people.

The Challenge:

1. You will create packaging for an (OH, Yes!) egg!!

1. The packaging will need to keep your egg safe and unbroken from a drop of 3 feet.

1. You will have 30 minutes to complete your challenge.

Materials:

Recyclable objects

Tape

Glue

Thanks!

Any questions?

You can find me at:

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