

Bring Agriculture to Life in Your Classroom...

...while addressing the IL Learning Standards in English language arts, math, science, & social studies!

All lessons available for download from <http://www.ilaged.org/AITC>

Illinois Lesson Overviews



English/Language Arts

Cattle Corrections— Most kids love hamburgers, but how much do they know about raising beef cattle? Students will practice their proofreading and editing skills while learning cattle and farming terminology and how cattle are raised.

City & Country Contrast through Poetry— How does country life compare to living in the city? Students will read and interpret poetry concerning the people and characteristics of rural and urban Midwest communities.

From Bluestem and Bison to Corn and Cattle— How small is 1/100th of 1%? Use this activity to demonstrate the dramatic change from tallgrass prairie to fields of corn and soybeans in less than 100 years. This activity uses a single sheet of paper that students fold and tear as they learn how the landscape of Illinois has changed over time.

Home Grown in Illinois— Most people would guess that Illinois farmers grow a lot of corn. But is corn the only farm commodity produced in Illinois? What's a commodity, anyway? Students will read informational cards to learn about the top farm commodities from this state. They will then research another farm product in order to create a new commodity card to share with others.

Investigate Illinois— Illinois is known for famous figures like Abraham Lincoln and features like expansive fields of corn. However, Illinois is also home to many lesser-known but equally interesting features. Through a series of fact cards, students will investigate agriculture, people, historical tidbits, and sites unique to the state.

Let's Talk About It: Lincoln-Douglas Debates— How can people have civil, informative conversations about important issues? Formal debates are an organized way for individuals to express their beliefs and reasoning, and for audiences to hear the debaters' views. Students will learn about the famous Lincoln-Douglas debates and stage their own debate on the contentious topic of genetically modified organisms.

Prairie Passages— How do we know what an Illinois prairie was like in the early 1800's? We depend on written accounts of explorers and settlers who first traveled here. By reading their letters, journals and personal accounts, we can learn a great deal about the people and their journey and experiences related to an Illinois prairie.

Who are the Amish?— Your students may not be able to fathom living without TVs, cellphones, or cars. Yet there are entire communities of people who do just that. Students will explore Amish traditions and compare them to modern non-Amish traditions of today.

Math

Futures Trading— M&Ms represent different corn varieties in this lesson about marketing commodities. Students will discover there's more to farming than planting and harvesting as they predict future yields, sell on the futures market, and calculate net income after harvest.

How Many Deer are Here?— Hunting for meat and sport is a contentious topic. But without natural predators like wolves, hunting is needed to keep the deer population at a healthy level. Chart-reading, math, and map skills are reinforced as students work with deer population statistics.

Illinois Agriculture by the Numbers— Are most farms owned by families? Which IL county produces the most corn? Students will interpret several types of charts and graphs to answer questions about Illinois agriculture.

Illinois Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. One type of logic puzzle utilizes a tool known as an elimination grid. Students will read about popular Illinois destinations and then use an elimination grid to solve the puzzle.

McDonald's: A Chicago Success Story— Engage students in the history of McDonald's Corporation as they perform calculations based on a table of historical prices and answer questions based on a timeline of McDonald's history.

Prairie Basics— Illinois is now largely covered by corn, soybeans, and other crops, but it was once covered by tallgrass prairie. This lesson conveys highlights of Illinois' prairie history and reinforces computation skills as students solve a word puzzle about our state prairie grass.

Trees Are for Treasuring...and Measuring— Trees are an incredibly important part of the ecosystem. Living for hundreds and even thousands of years and sheltering trillions of living things, they are essential to the living creatures who inhabit our planet. Introduce students to several methods of measuring trees and a way to measure their importance to Earth's water cycle.

Science

Corn & Soybean Processing and Products— Why do farmers grow so much corn and soybeans? How are these crops used? Students will explore the wealth of products derived from these two humble seeds, research the steps involved in their processing, and conduct experiments to discover why they are so versatile.

Navigating the Water Highways— How do rivers like the Mississippi impact all our lives? Our major rivers move fertilizers farmers use to produce crops we consume, salt that melts ice on our roads, and grain sold to other countries thereby helping our nation's economy. Students will explore the importance of rivers, discover the role of locks and dams, and build miniature dams in an experiment comparing dam construction materials.

Prairie Plant Adaptations— You look at your beautiful green lawn and there it is....a dandelion! You grab a spade to remove it. As you try to dig out every bit of its roots, you wonder, "How far down does this thing go?!" Dandelions are a perfect example of a plant adapted to survive the harshest conditions. Students will examine adaptations that allow native Illinois prairie plants to survive drought, fire, wind, grazing, and extreme temperatures.

Science in Your Shopping Cart— Have you ever wondered about the science behind items in your shopping cart? Scientists continually research new products and improvements to current products. Students will take a look at some of the research taking place. Then they will employ the scientific method as they experiment with absorbency of different substances. Students will also learn about exciting careers in science and technology.

Skyscraper Science— Tension, compression, and torsion, oh my! Students will exercise their engineering design skills as they learn and implement the science concepts required in skyscraper construction.

Sprouting Success in Illinois from North to South— Choosing plants that are best to grow in your area is an important first step in having a successful crop. A good place to start is to research plants that are best suited for your growing zone.

Social Studies

Flags are Symbolic— Students will learn that flags represent important facts concerning the country, state, and county they represent. They will learn about the flags of the United States, Illinois and Chicago. They will create a flag that represents themselves.

Illinois Road Trip— GPS mapping apps are nice, but map-reading skills are still important to use them effectively. This lesson teaches skills such as finding coordinates, understanding the cardinal directions, and reading an index as students use paper highway maps to explore interesting sites across the state.

Let's Gather Together— Have you ever thought about the types of events that bring large numbers of people together throughout history? Many such events, from local corn-husking contests to state fairs, center around agriculture. Students will identify, explore, compare, and contrast some of the events, fairs, and shows that bring us together.

Prairie State Mapping— It's a hot summer day and the clouds are becoming grey and ominous. Your cell phone sounds an alert to notify you that the counties of Livingston, Grundy and LaSalle are under a tornado warning. Should you seek cover? Students will practice map-reading skills as they explore Illinois geography, history, and prominent landmarks.

Stockyards to Skyscrapers— From the stockyards of the 1800s to the skyscrapers of today, the landscape of Chicago has changed dramatically over time. Students will use informational reading skills to answer questions about Chicago history.

The Shape of Illinois— Illinois isn't just flat land covered with corn. Students will create clay relief maps of Illinois as they learn how glaciers shaped the state and how the shape of the land impacts agriculture.

Wealth of Illinois— Who decides which birds, mammals, and other items become our state symbols? Student will learn how a bill becomes a law as they dig into the establishment of our state soil.

Dairy Lesson Overviews



Cheese Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn about types of cheese and then use an elimination grid to solve a puzzle.

Cud to Curd— Doesn't a gooey bowl of macaroni and cheese sound good? What kind of cheese do you like best in this dish? Or, do you like a blend of several different types? Students will follow the process from cow to cheese and learn fascinating facts about the steps it takes to make some of our favorite cheeses.

Ice Cream in a Bag Experiments— I scream, you scream, we all scream for ice cream, but did you know the fat content of the dairy ingredients can change ice cream's flavor? Use this favorite treat to engage students in science inquiry.

Making Cottage Cheese— Little Miss Muffet sat on her tuffet eating her cottage cheese...wait, what? The cheesemaking process involves the by-products of curds and whey. This activity will result in a snack for students to taste!

Milk Math— Most of us understand milk quantity by volume. A school lunch milk carton contains 8 ounces, 1 cup or $\frac{1}{2}$ pint. Jugs of milk at the grocery store usually contain 1 gallon. But dairy farmers measure the milk production of their cows by weight, not volume, and they are paid by the hundredweight, or 100 pounds of milk. Challenge students to convert milk measurements from volume to weight and back again as they explore the steps from udder to glass.

Moo-ving Through the Ages— As we have moo-ved through the ages, many changes have taken place in the dairy industry. We have gone from lots of farms with some cows milked by hand with no electricity to fewer farms with larger herds utilizing technologically-advanced, automated systems. Explore changes in the dairy industry via a timeline, Illinois dairy statistics, primary source images, and a farm family's story.

Penciling Out Dairy Production and Profit— Students sometimes say, "When am I ever going to use this in real life?" Well, any time you produce something to make money, you need to keep track of the costs of production compared to the value of what is produced. Students will explore the profitability of milk production as they perform calculations using actual dairy statistics.

Supply and Demand— Students will work together on the concepts of supply, demand and pricing. Working with various scenarios, they will decide the effects of these scenarios on supply, demand and pricing of items.

What Kind of Milk Do You Drink?— Ask your students where milk comes from, and they will surely reply, "cows!" But are cows the only source of milk consumed by humans? Students will learn about other animals used for milk and why dairy-providing species vary across the globe. They will then generate questions to prompt further research into dairy production.

Insect Lesson Overviews



A Career “IST” Search— BUGS! Some people swat, stomp, scream, or run from them. But if you have a student who finds bugs interesting, they could consider a career as an entomologist. Entomology—the study of insects—combines agriculture, botany, zoology, biology and horticulture. Use this activity to explore other occupations that connect insects and agriculture.

A Day in the Life of...— What’s the buzz about bees? Students will investigate the three types of honey bees in a colony, identify their roles, and recognize honey bees as part of a community that works together.

Beekeeper Economics— Beekeeping is a hobby and business that is rapidly growing in popularity. Exercise students’ calculation skills as they explore the costs of raising bees for honey.

Beyond the Bug— How often have you heard—or said—“Eww, a bug!” But insects play an important role in our everyday lives—and not just as pollinators or producers of honey. Students will discover several other ways humans use insects.

Butterfly Wingspan Graphing— Which is larger, a Monarch or a Viceroy? Students will use data from a chart to make a bar graph. They will also work with fractions, decimals and percentages.

Examination of the Body of a Grasshopper— Grasshoppers can be destructive agricultural pests. How do their bodily traits help them survive? Students will examine grasshopper specimens to identify their key characteristics.

From Hatch to Harvest: The New Food Frontier— Entomophagy, or eating insects, is practiced in many countries. Insects have a high nutrient content, while insect farming can be highly efficient, using fewer resources than other types of farming. For these reasons, raising insects as food is considered one solution to feeding the world’s growing population.

Insect Life Cycles— As students explore the life cycles of insects, they will learn the steps of complete and incomplete metamorphosis. Along the way they will also investigate pheromones and how they are used by insects.

Insect Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn about insects and then use an elimination grid to solve a puzzle.

Integrated Pest Management— Students will learn about Integrated Pest Management by making decisions for an inherited potato farm, realizing the consequences of their decisions, and discovering how supply and demand affect commodity prices.

It Starts with “M”...Monarchs, Milkweed, Migration and More!— A is for apple and B is for bat. How many of us learned the alphabet by relating a common object with each letter? In this activity, students will use this same principle to share information that they uncover through Monarch butterfly research.

The Boll Weevil— The boll weevil was a highly destructive insect to cotton crops in the South. As a result, Carver introduced crop rotation. Students will learn about monuments including the Boll Weevil Monument, as well as how cotton and peanut production have changed over the years.

What’s for Lunch?— Grasshoppers, mosquitoes, houseflies, and butterflies depend on different foods, ingest those foods differently, and occupy different places on the food chain. Students will learn about food chains, create their own food chains, and use research materials to learn more about an insect of their choice.

Machines Lesson Overviews



Changes in Farming—Students will acquaint themselves with historical farm machinery terms as they learn what changes occurred in farming methods and yields during the 19th and 20th centuries. Challenge students to practice math skills as they ponder those changes.

Compelling Careers in Agriculture— Ask most kids how many agricultural careers they can name, and they are likely to say, “Farmer, rancher... um, I can’t think of anything else.” As a result, many young people cannot see themselves in an agricultural career. This activity will introduce students to compelling careers in the ag industry.

How Much does that Tractor Really Cost?— Buying a tractor is a lot like buying a car. In addition to the purchase price, make, model, features, and fuel efficiency are factors to consider. But farmers must also analyze the ownership and operating costs of equipment over time. Get students thinking about farming expenses as they perform calculations to estimate tractor ownership costs.

Inventors John Deere and Cyrus McCormick

McCormick— Students will learn how John Deere and Cyrus McCormick’s inventions changed agriculture as they explore their lives and create a timeline of the events pertaining to these two famous inventors.

Lubricants, Viscosity and Machines— Have you heard the phrase “well-oiled machine?” For machines to work effectively, they must run smoothly with no glitches. Many machines, including cars, trucks, tractors, and combines, require lubricants to prevent wear and tear. A lubricant’s weight, or thickness, tells us the viscosity when tested at a specific temperature. Students will utilize the scientific method as they test the viscosity of household liquids at various temperatures.

Machine Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn about machines, then use an elimination grid to solve a puzzle.

Machine Safety Specialists— Machines help people get work done more quickly and easily than working by hand. But the very power that makes them useful can also make them dangerous. This lesson discusses safety guidelines for machines used on the farm and beyond.

Mystery Tools— When you see an object you are unfamiliar with, what skills can be used to figure it out? As students explore a variety of tools, they will hypothesize what each tool is, who may use it, where and when it may be needed, and how it works.

Precision Agriculture— When you think of a farmer, do you imagine a person sitting in a tractor watching the implement behind them while the tractor steers itself? Someone operating an unmanned aerial vehicle to gather crop data in the field? A person at a computer analyzing field maps to calculate fertilizer needs? Believe it or not, these scenarios are typical on many of today’s farms. This lesson delves into precision agriculture, which uses various technological tools to ensure crops receive exactly what they need for optimum health and productivity.

Simple and Complex Machines— Students will identify simple and complex machines as they analyze a variety of household, classroom, and farm items. Follow up the opening task by sending students on a machine scavenger hunt in their classroom, school, or home.

Simple Machines, Complex Inventions— Let students’ creativity shine as they learn about simple and complex machines. In the style of Rube Goldberg, students will make the simple task of shelling an ear of corn overly complicated in cartoon style.

Timeline of Farm Machinery & Technology— What inventions have improved agriculture over time, and how have they impacted society? Students will read and interpret a timeline and graphs to gain information, answer questions, and create a new graph.

Tinkering Outside the Box— This set of “tinkering” lessons crosses all four academic disciplines as students use everyday items to construct a machine that moves. As you use each of the four lessons, your students will move a project from design development, to machine construction, prototype testing, creating scale drawings, and applying for a patent. Students will use their “thinkers” as they “tinker!”

Tractor Power Poetry— When students are directed to write a poem, do you see their eyes glazing over and hear heavy sighs? This lesson will introduce or increase students’ poetry writing skills while focusing on a farm machine they should all recognize. After exploring types and uses of tractors via images and videos, students will write about tractor using simple, poetic forms.

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Plant Lesson Overviews



American Agriculture’s Share of the World Production— While learning about USA agricultural import and exports, students will use data from charts to perform math calculations with fractions and decimals. They will also convert chart information into a bar graph.

Corn Plant Genetics— Simplify genetics instruction with manipulatives! Students will construct chromosomes with colored paperclips, illustrating the role chromosomes have in how genes are inherited from parent to offspring.

Corn & Soybean Processing and Products— Why do farmers grow so much corn and soybeans? Explore the wealth of products derived from these two humble seeds, study the steps involved in their processing, and conduct experiments to learn why they are so versatile.

Crop Swap: Rotating Crops for Sustainability— Just as humans extract nutrients from the foods we eat, crops extract nutrients from the soil. When we run short on nutrients, we eat more food. What happens to soil when its nutrients are depleted? Crop rotation is one important tool farmers use to sustain the soil and maximize crop health.

Exploring Types of Seeds: Monocots & Dicots— Why not learn plant science concepts while focusing on the #1 and #2 crops grown in Illinois: corn and soybeans? Students will identify the parts of a seed, learn about germination, and compare the growth of monocots and dicots.

Farm Crops and Animals Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn about farm crops and animals then use an elimination grid to solve a puzzle.

George Washington Carver— He has been called “the Father of the Peanut Industry,” having invented hundreds of products from peanuts. Learn more about this important innovator and the role he played in American history.

Growing Illinois Agriculture by River, Rail, & Road— How did Illinois become a major supplier of agricultural products to the United States and the world? It’s a fascinating story that begins with rivers. Students will find out why.

Illinois Agricultural Commodity Income— Students will learn about Illinois commodities income while using graph interpretation and basic math skills, including fractions, decimals, and using large numbers.

Peanut Production— Peanuts are America’s favorite nut. Learn about the global popularity of the peanut by interpreting tables and maps.

Percent Germination for a Soybean Sample— Students will germinate seeds, graph their growth, and practice their skills with, fractions, percentages and decimals.

Plant Experiments— Students will have an opportunity to explore the scientific method by designing individual mini experiments within a whole class experiment.

Sprouting Success in Illinois from North to South— Choosing plants that are best to grow in your area is an important first step in having a successful crop. A good place to start is to research plants that are best suited for your growing zone.

Tassel to Table— Students will learn about the path corn takes from the field into food products we use every day. This lesson explores careers throughout the process, as well supply issues that can affect the food supply chain.

Terrariums— Students will be able to observe the water cycle and how different types of seeds germinate and grow as they build and maintain their own terrariums.

Poultry Lesson Overviews



Chicken Riddle— How many chickens will the average American consume in their lifetime? Make math fun as your students complete a series of 3-digit addition and subtraction equations. If they solve the problems correctly, they will be able to answer the riddle!

Chicken Wings— Despite the popularity of chicken wings as a snack or meal item, many people do not realize the similarities between chicken wings and the human arm. By dissecting a chicken wing, students will identify the parts of the wing that mirror those of a human arm.

Egg Anatomy— When you crack open an egg for cooking or baking, do you ever think about the parts inside? What is the actual purpose for each part of an egg? This lesson will have students investigating, identifying, and diagramming each part of the egg—a food ingredient we generally don't think much about beyond the final food product for which they are used.

Egg Farming Then and Now— Eggs show up scrambled on our breakfast plates, hard-boiled in our lunch bags, in fancy frittatas on our supper tables, and baked into countless cookies and cakes. We eat a LOT of eggs, but where do they come from, and how are they produced? Engage students in inquiry, sequencing, comparing, and contrasting as they reflect on eggs as human food and examine egg production over time.

Egg Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn about eggs, then use an elimination grid to solve a puzzle.

Embryology Terminology— Use this lesson as an interest approach to spark student curiosity about the incubation process and to become familiar with terms that may be used during an embryology unit. This activity may also be used as an assessment tool.

Hatch Time Graphing— When you see eggs in a bird's nest in the spring, do you ever wonder how long it takes them to hatch? What about chickens—do their eggs take the same time to hatch as that of the doves in your yard? Students will practice graphing skills as they compare the incubation period of ten different birds.

Poultry Dishes Around the World— What's your favorite way to eat chicken? Is it chicken nuggets dipped in honey mustard, a spicy chicken sandwich, or crispy fried chicken? What impact do your family traditions have on what you like to eat? This lesson engages students in geography as it celebrates the cultures of ten different countries.

Poultry Jeopardy— What's more fun than learning while playing a game? Students will create their own Jeopardy-style game by researching poultry facts.

Shell Porosity— Shell porosity? Osmosis? Egg magic? By conducting and observing these "egg"periments, students will gain a deeper understanding of some parts of an egg.

The Nutritious Egg— Eggs contain the highest quality protein known, second only to mother's milk for human nutrition. Eggs also contain all 9 essential amino acids that a human body cannot produce. Learn more about this nutritional powerhouse!

Soil Lesson Overviews



Agriculture Measures Up— Students will use problem-solving and everyday math to calculate the correct amount of fertilizer needed to nourish their lawn. By figuring the area of the lot, driveway, patio, house and garage, students will determine the number of bags of fertilizer to purchase for the grassy area only.

Say It With Soil— Words can have such an impact! Soils have been a topic of conversation for centuries. Read a collection of quotes that highlight the importance of soil. Pick one and try to determine the author's intent and their connection to soil. Are these quotes still relevant today or are they outdated, archaic musings?

Soil Erosion— Has soil erosion increased or decreased in recent decades? Students will use soil erosion data to complete mathematical problems to create and use a bar graph.

Soil Logic Puzzle— A logic puzzle is a problem that can be solved using deductive reasoning, or logical conclusions drawn from two or more true statements. A common type of logic puzzle utilizes a tool known as an elimination grid. In this activity, students will learn how to make an edible soil profile, then use an elimination grid to solve a puzzle.

Soil Search, Sample, & Analysis— In this lesson, students will prepare soil samples from several areas in order to test pH levels.

Soil: The Secret to Our Survival— Every day, most of us look down on a substance that helps sustain our very lives. We trample it, ignore it, and try to wash it away. Send students on a web quest to explore aspects of this critical natural resource in order to develop infographics, PSAs, or videos to raise awareness of soil's importance.


The Dust Bowl— What happens when a combination of drought, poor farming practices and high winds turns millions of acres of the Great Plains into a wasteland that kills crops, livestock, and the dreams of homesteaders?

Understanding the Soil Triangle— Students will use the soil triangle to find what types of soil they have and to find various geometric shapes found within the triangle.

Wealth of Illinois— Who decides which birds, mammals, and other items become our state symbols? Students will discover how a bill becomes a law as they dig into the establishment of our state soil.

What is Soil— What is in the soil below our feet, our plants, our roads, and our buildings? Students will explore what soil is composed of, as well as the textures of soil. They will act out how water moves through various types of soil.

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**Hands-on learning kit & resources for these lessons available from:
Macoupin County Agricultural Literacy Program, 217-854-9604
Coordinator Connie Niemann's email cniemann@illinois.edu**