



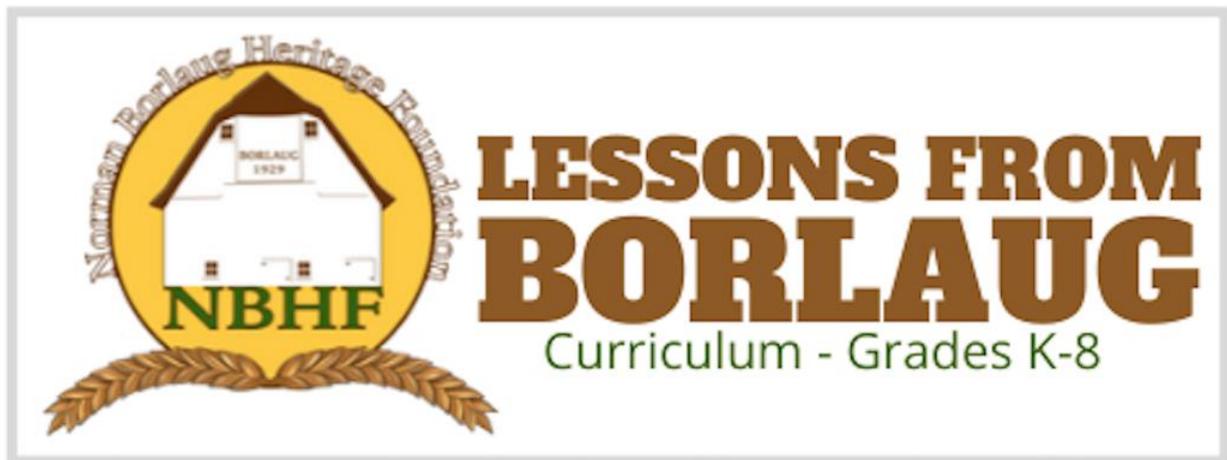
This master curriculum includes lessons for 6th Grade. Sixth graders will gain an understanding about the domestication of animals and its prevalence to the state of Iowa. Over time, Americas have learned how to communicate with animals. That is why we can use their strengths to help make our lives easier.

Educators may find this curriculum useful to use prior to attending the Borlaug farms. The Norman Borlaug Heritage Foundation provides educational opportunities for schools to attend. Whether attending a tour or participating in Inspire Days, children will become aware of Norman Borlaug's work and his everlasting impact on the current day.

Want to learn more about Norman Borlaug or the Norman Borlaug Heritage Foundation? VISIT OR CALL!

Contact Chamber of Commerce for more information
101 2nd Ave. SW, Cresco, IA 52136
Email: Jason@howard-county.com
Call: 563-547-3434

Borlaug Farms Addresses
Birthplace farm: 20399 Timber Ave Cresco, IA 52136
Boyhood Farm: 19518 200th St. Cresco, IA 52136



6th Grade

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Taming the Wild Aurochs

Grade: 6th grade

Time: 60 minutes

Purpose:

- Students will read about research into the domestication of animals to better understand why and how they are raised on a farm.
- Students will create a timeline of animal domestication for visual understanding of the evolution of domestication.
- Students will learn how the domestication of animals has provided financial support for Norman Borlaug's family in the 1920's.

Materials:

- Student Worksheets A, B, and C., 1 per student
- Internet access for student research

Vocabulary:

- Auroch – an extinct bovine mammal of northern Africa, Europe, and western Asia, believed to be the forerunner of domestic cattle
- Breed – a group of animals descending from a common ancestry and possessing certain common characteristics which distinguish it from any other group
- Descendant – a person born into a particular family
- Domesticated animal – an animal that has many of its needs provided by humans
- Fertilizer – any of a large number of natural and synthetic materials, including manure and nitrogen, phosphorus, and potassium compounds, spread on or worked into soil to increase its capacity to support plant growth
- Herd – a group of cattle or other domestic animals of a single kind that is kept together for a specific use
- Manure – animal dung, compost or other decomposed organic material used to fertilize soil
- Predators – animals that live by preying on others
- Selective breeding – selecting certain individuals' animals to be the parents of the next generation, based on desired characteristics
- Wild Animal – an animal that provides for its own food, shelter, and other needs



Spark Curiosity By...

1. Ask students to brainstorm and make a list of items which are necessary for survival. Encourage students to list only the very basic items that provide food, clothing, water, and shelter.
2. Next, identify the source of each of these necessities. Natural resources provide our water supply, but likely in every other case, agriculture or farming provides all others. (food to eat, timber to build houses, etc.)
3. Ask students if our society has always relied on agriculture to provide our necessities of life. (*No*) Use student comments and ideas to guide your discussion. Point out that the implementation of farming changed the nature and practices of ancient civilizations.

Agricultural Background

All **domesticated animals** have their origins in wild ancestors, but it takes hundreds of years for an animal species to be completely domesticated. Humans had already been domesticating animals for thousands of years before anyone began recording history. The first domesticated animals were probably raised as pets, for sports, or for religious purposes. Archaeologists believe people did not begin to domesticate animals until they had settled into communities and established reliable food supplies through farming or fishing.

The dog was the first animal to be domesticated, probably 10,000 to 12,000 years ago. Sheep and goats came next, around 7,000 BC, in the Middle East and Central Asia. Cattle were domesticated in South Asia, the Middle East and Europe by 4,000 BC. Pigs were domesticated at about the same time. Present-day cattle derive from the wild **aurochs** (or-oks), a huge beast which sometimes stood five feet at the withers, had horns three feet long and weighed a ton.

The easiest animals to domesticate were **herd** animals. Herd animals follow the lead of a dominant member. They stay close together and move together. Early farmers could use surplus grains to attract hungry animals, especially in times of drought. They watched the animals and learned their food and water needs. They would lead them to suitable pasture and water and protect them from **predators**. The animals grew accustomed to having humans around and gradually became tame.

Although farmers would kill some of the tame animals for food, they would save the youngest and the tamest. The farmer would kill the animals that were most difficult to manage and save those that were more tame. The animals that ate the most would be



killed as well. The smaller, tamer animals would reproduce, and eventually the entire herd would become smaller and more tame. This was the beginning of the practice we know now as **selective breeding**.

At first the tame animals were used only as an easy source of meat. Later the farmer noticed that crops grew better on plots where animals had grazed and realized the value of animal **manure** as **fertilizer**. Through more observation, the farmer realized the animals' milk could provide another food source.

Eventually humans discovered they could weave the hair of animals like sheep and goats to make cloth for clothing. The Sumerians were the first to develop sheep and goats with the woolly coats we use for making cloth today.

Sometime before 3300 BC, farmers in Sumer and nearby Egypt started using animals as beasts of burden. Wooden plows were invented and drawn by oxen or asses to turn over the irrigated fields. Farmers also found they could harness animals to haul carts loaded with the harvest, making it possible to move large amounts of grain to a storage point or canal boat for further transport. In the New World, the alpaca, llama, duck, turkey and dog were all domesticated by the time of the first European explorers. Early European settlers brought their domesticated animals with them when they came to the New World. These included cattle, sheep, goats, pigs and chickens. Horses were introduced to the New World by the Spanish in the 15th Century. Many of them escaped to form the wild mustang herds in the West.

In the past 100 years, farmers and ranchers have begun to domesticate some other species of **wild animals**. On the Great Plains of North America, the bison, a herd animal, had roamed the grasslands for thousands of years. Prehistoric humans living on the plains hunted the bison but did not make any serious efforts to domesticate them. In the late 1900s, when hunters threatened the bison with extinction, some ranchers and other conservationists began rounding up small herds. Over the past 100 years these small herds have grown into large ones, and in some parts of the Great Plains, cattle ranchers have begun replacing their cattle with bison herds. Since the bison are native to the Great Plains they are better adapted than cattle to the conditions present there.

Lesson

Activity 1: Hunting and Gathering

1. Explain to your students that before human civilizations began to farm their land, all people were "hunter gatherers." Ask students to use the context clues found in these words to describe what a *hunter gatherer* is.
2. Use the following questions to help students visualize and understand a hunter gatherer society:
 - How would a civilization's geographic location have affected the availability of food?



The climate and location of their civilization would indicate what food (from both plants and animals) was available. For example, if they lived near the sea, they may have fished. If they lived in the desert, they would have less available food than a civilization in a forested area with more moisture.

- Did hunter gatherers live in one place for long periods of time?
No. Civilizations followed their source of food. When the resources in one area became depleted, they packed up and moved to the next area. These people were called nomads.
- What plant-based food would hunter gathers have consumed?
Any edible plant that grew naturally in their surroundings. This could have included berries and fruits or edible plant roots. Generally, the more tropical the climate, the more they could rely on plant-based foods.
- What kind of animals did they hunt?
It varied depending on the location. In general, they hunted wild game no larger than a deer or wild boar. Rabbits, and various bird species were also common.
- Were there gender roles in these societies?
Yes, the women primarily did the gathering and the cooking. The men did the hunting.
- Could hunter gatherer societies consume a diet with a wide variety of foods? Did their diet change from season to season?
No, compared to the average diet today, hunter gatherers consumed only a small variety of foods depending on their location. Yes, their diets changed with the seasons as food was available.

Activity 2: Domestication Timeline

1. Read and discuss the vocabulary words as well as the information contained the *Background Agricultural Connections* portion of the lesson.
2. With your students, compare and contrast the characteristics of domestic animals and wild animals. Draw a line down the center of your board to list contrasting characteristics.
 - **Behavior:** Wild animals do not want to be around humans. Domestic animals are tamer.
 - **Reproduction:** Wild animals reproduce by the principle of "survival of the fittest." The reproduction of domestic animals is controlled by their caretaker who identifies ideal characteristics they would like in their offspring and selectively breeds animals with those characteristics.
 - **Feed:** Wild animals provide their own subsistence. Predators must hunt their own food, and foragers move to find suitable lands for grazing. Domestic animals rely on their caretaker to provide their feed.
 - **Appearance:** Domestic animals develop a different appearance than their wild ancestors. This takes place due to selective breeding. (For example, a wild boar and domestic farm pig look similar in structure, but have changed significantly in domestication) Wild animals maintain the characteristics needed for survival.



3. Discuss the interdependence of humans and animals over the centuries. Why did some animals become domesticated while others did not?
 - Optional: To further teach and illustrate this principle, show the video clip [Guns, Germs and Steel \(Part 5\)](#). The first four minutes of the video discusses the ideal characteristics for domesticated farm animals. The second half of the video clip discusses various civilizations around the world and the evidence of early farming practices.
4. Hand out *Student Worksheets A and B*. Instruct students to read the information on *Student Worksheet A* and use it to complete *Student Worksheet B*.
5. Each student will select one of the domesticated animals mentioned on *Student Worksheet A* and use online search engines and library references to research the animal's history and use today.
6. Hand out *Student Worksheet C*.
7. Discuss the meanings of BC and AD in reference to ancient history. Discuss the fact that the 1990s took place in the 20th Century. Caution students to remember this as they complete the timeline on *Student Worksheet C*.
8. Have the students use resource materials and online searches to find agricultural or historical events that were happening during the time period when each of the animals listed on the worksheet was being domesticated. Students should place these events on the timeline.
9. On a world map, ask students to locate the places listed on *Student Worksheet A* where the following animals may have first been domesticated: sheep and goats; cattle; rabbits.
10. As students complete the worksheet, ask them to research online what animals were domesticated on the North American continent pre-Columbus and what animals were later brought by European explorers and settlers.

Activity 3: Farming

1. Tie the lesson together by discussing and further comparing the benefits our society today enjoys due to farming versus those found through hunting and gathering. Use the following key points to direct the discussion:
 - Farming allows for a greater abundance of food. More food can be farmed on a given plot of land than could grow naturally.
 - Our food supply has a much greater variety of foods and food groups to obtain the nutrients we need and to enjoy the food we eat as well.
 - Our food supply is more stable and sustainable. While crop failures can occur in modern farming, they are less likely than they would be if we were relying on nature to provide our food.
 - The location of our communities and cities does not rely upon the local food sources. In most cases, food is grown in the ideal climate and region, then shipped all over the country and even world. Populations can have permanent residence rather than living as nomads.



Connection to Norman Borlaug

We know that the domestication of animals started many years ago and has continued to shape society over time. Now, we have markets specific to each type of domesticated animals, especially livestock. Let's learn how Norman Borlaug's family used domesticated animals to make a living.

Norman Borlaug grew up on a farm outside of Cresco, Iowa from 1914-1933. There, his family raised horses, beef cattle, hogs, and dairy cattle.

1. Have an open class discussion about the role each of these domesticated animals played on the Borlaug farm. Keep in mind what technology and modern practices were available at the time of his youth. Some student answers may include...
 - Horses: horse drawn plows and transportation
 - Beef cattle: sell for income or meat
 - Hogs: will eat food scraps from family, sell for profit, eat meat
 - Dairy cattle: Will milk cow for milk to create cream, butter, or income by selling products

Norman's dad would take 2 horse-drawn trips into town each year to sell off their market animals; beef cattle and hogs. He would take 10 cattle to a train stop where they would be shipped to Chicago stockyards. Similarly, 12 hogs would be taken into nearby town Lawler in the icy winter months. The family would then receive a few dollars for compensation from a stranger paymaster in Chicago a few weeks later. An alternative source of income came from cream. Monday's and Fridays Henry would take 6 milk cans of cream into a nearby town, Saude.

2. Post on the board how much money the Borlaug family would make for each product.
 - 1 beef cow = 5 dollars
 - 1 hog = 4 dollars
 - 1 cream can = 1.5 dollar
3. Based on the story above, have students work individually to calculate how much money the family would make in one year. (note: there are 52 weeks in a year)
 - 10 cows: $(5) \times (10) = \mathbf{50 \text{ dollars}}$
 - 12 hogs: $(4) \times (12) = \mathbf{48 \text{ dollars}}$
 - Cream: $(12) \times (1.5) = 18 \text{ dollars}$
 1. $(18) \times (52) = \mathbf{936 \text{ dollars per year}}$
 2. **Total: \$1026**

At that point in time with that income, the family was living just above the poverty line. We can see that their main source of income came from domesticated animals! Without these animals, they would be hungry, broke, and without purpose.



Sources/Credits

- <http://www.encyclopedia.com/doc/1G2-3400500110.html>
- <http://www.caaa.co.za/info/domestic-animals>
- <http://animals.howstuffworks.com/animal-facts/animal-domestication2.htm>

National Agriculture Literacy Outcomes

Agriculture and the Environment

- Compare and contrast the advantages and disadvantages involved when converting natural ecosystems to agricultural ecosystems (T1.6-8.a)

Plants and Animals for Food, Fiber & Energy

- Describe the differences in plants and animals used for food, clothing, shelter, and fuel before and after European settlement of the United States (T2.6-8.a)

Science, Technology, Engineering & Math

- Describe the process of development from hunting and gathering to farming (T4.6-8.c)

Education Content Standards

Within CAREER

Animal Systems Career Pathway

- AS.01.01

Common Core Connections

Reading: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.R.1
- CCSS.ELA-LITERACY.CCRA.R.10
- CCSS.ELA-LITERACY.CCRA.R.3

Speaking and Listening: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.SL.1
- CCSS.ELA-LITERACY.CCRA.SL.5

Writing: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.W.8
- CCSS.ELA-LITERACY.CCRA.W.9

Students have now learned about the evolution of domestication. We have tamed animals so that we can use their strengths to power human life. Whether this includes food, shelter,



clothing, or fuel, the domestication of animals has changed our lives. Let's learn about the two most common domesticated animals in Iowa!

Eggs on the Menu

Grade: 6th grade

Time: Four 15-minute activities

Purpose:

- Students will learn the versatility, function, and nutritional benefit of eggs in a healthy diet, identify the function and role of eggs in a recipe, identify forms of technology used on an egg farm, and understand how eggs are classified by size.
- Students will learn how collecting and cooking eggs in the 1920's is different than cooking and collecting today.

Materials:

Activity 1: *An Eggs-ceptional Meal* Handout, 1 per student

Activity 2: *T-egg-nology* handout, 1 per student

Activity 3:

- *Egg Sizing: A Case Study* handout, 1 per student
- Large/jumbo egg, 1 per group of 4 students
- Medium/small egg, 1 per group of 4 students
- Scale, 1 per group if possible

Resources:

- [T-egg-nology handout](#)
- [Egg Sizing: A Case Study handout](#)
- [A Family L-egg-acy \(Optional Enriching Activity\)](#)
- [An Eggs-traordinary Multi-Tasker](#)
- [An Eggs-ceptional Meal handout](#)

Vocabulary:

- **Nutrients:** a substance that provides nourishment essential for growth and maintenance of life
- **Protein:** an essential nutrient responsible for building structural components of body tissues such as muscle, hair, and collagen

Spark Curiosity By...

Activity 1: An Egg-ceptional Meal

1. Give each student 1 copy of the *An Egg-ceptional Meal* handout. Have students complete the True/False quiz. Review the answers as listed below:
 1. **False.** Eggs have a high nutrient density, especially in proportion to their calorie count. One egg contains 13 essential vitamins and minerals, plus high-quality protein and antioxidants—at just 70 calories per egg!



2. **False.** Almost half of the egg's protein is in the yolk.
 3. **True.** Egg protein has all nine essentials and all nine non-essential amino acids, making it a complete protein food second only to mother's milk for human nutrition. A large egg provides 6 grams of protein, 13% of the recommended Daily Value (DV) for protein.
 4. **True.** Eggs help form muscle tissue and build muscle strength.
 5. **False.** Egg yolks contain the most nutrients, including Vitamins A, B12, D, and E.
 6. **False.** The protein from eggs provides sustained energy throughout the morning, making you feel fuller longer and making eggs a top choice for weight control.
 7. **True.** Eggs contain choline, a nutrient that helps maintain brain cell membranes. Choline's importance to fetal brain development makes eating eggs part of a healthy diet for pregnant women.
 8. **False.** Eggs are lower in cholesterol than previously believed. Recent studies* show that the average amount of cholesterol in one large egg is 185 mg, a 14% decrease from past measurements. The American Heart Association suggests a dietary guideline of less than 300 mg of cholesterol per day, so it is perfectly healthy to enjoy an egg a day without increasing the risk for heart disease.
 9. **True.** This amazing fact proves that eggs do indeed offer the highest protein quality among all foods!
 10. **True.**
2. Have students complete *Part 2 and Part 3* of the worksheet.
- On Part 2, student responses will vary, but may include Breakfast—scrambled, poached, fried, omelet, boiled, baked, over easy, over hard; Lunch—frittata, quiche, egg salad, egg sandwich; Dinner—deviled eggs, Pad Thai, pasta salad, etc.
 - On Part 3, assign students to form teams to create a menu for breakfast, lunch, or dinner that features eggs in the core dish. Have them share completed menus in class or prepare their meals for a class tasting.
 - **In 2010, a random sample of regular large-shell eggs was collected from locations across the country to analyze the nutrient content of eggs. According to the resulting USDA nutrition data, eggs are lower in cholesterol than previously recorded. The USDA results show the average amount of cholesterol in one large egg is 185 mg, down from 215 mg—a 14 percent decrease.*

Agricultural Background

Nutrients are chemical elements that are essential to plant and animal nutrition. While no one food (other than mother's milk, perhaps) provides all the nutrients a human needs, the



egg contains a wide array of essential nutrients. After all, the egg was designed by nature to supply everything needed for the creation and nourishment of a baby chick.

All eggs contain the nutrients; **protein** and fat. Egg protein is of such high quality that it is often used as the standard by which other protein foods are measured. Egg protein contains all the essential amino acids (building blocks of protein which the body needs but cannot make) in a pattern that matches very closely the pattern the human body needs. This is why eggs are classified with meat in the Protein Food Group and why egg protein is called a *complete protein*. With the exception of vitamin C, an egg contains varying amounts of all the essential vitamins plus many minerals. An egg yolk is one of the few foods which naturally contain vitamin D, the sunshine vitamin.

Although eggs are widely known as breakfast entrées, they also serve in many other ways. In fact, the cooking properties of eggs are so varied that eggs have been called “the cement that holds together the castle of cuisine”.

Eggs bind ingredients in dishes such as meatloaves or crab cakes, leaven such baked high-rises as soufflés and sponge cakes and thicken custards and sauces.

Eggs emulsify mayonnaise, salad dressings and Hollandaise sauce and are frequently used to coat or glaze breads and cookies. Eggs clarify soups and coffee and retard crystallization in boiled candies and frostings. Eggs add color, flavor, moisture and nutrients to baked goods such as cakes. As a finishing touch, hard-boiled eggs often serve as a garnish.

Technology runs the world, and it’s no different for the American egg farming industry. With U.S. egg production averaging 75 billion eggs per year, the egg industry depends on technology to continue to meet rising consumer demands. This lesson highlights real-world examples of the role technology plays in modern egg farming. Students will explore ways in which science has driven innovation to improve hen health and ensure that production practices result in eggs of consistently high quality for the consumer, and how science has expanded the role that eggs play beyond their value as a food.

Several factors influence the size of an egg. The major factor is the age of the hen. As the hen ages, her eggs increase in size. The breed of hen from which the egg comes is a second factor. Weight of the bird is another. Pullets significantly underweight at sexual maturity will produce small eggs. Environmental factors that lower egg weights are heat, stress, overcrowding and poor nutrition. All of these variables are of great importance to the egg producer. Even a slight shift in egg weight influences size classification and size is one of the factors considered when eggs are priced. Careful flock management benefits both the hens and the producer.

Lesson



Activity 1: An Eggs-traordinary Multi-Tasker

1. As a class, brainstorm all of the foods that contain eggs as an ingredient. As students brainstorm, write their responses on the board. Categorize them by listing the egg entrees (scrambled, boiled, fried) on one side of the board and foods that use eggs as an ingredient (cakes, brownies, cookies, etc.) on the other side of the board.
2. Once you have a good brainstorm listed on the board, point to the foods using eggs as an ingredient and ask, "What purpose do eggs have in these recipes? How would the outcome be different without the eggs?"
3. Give each student one copy of the *An Eggs-traordinary Multi-Tasker* worksheet. Have students unscramble the egg functions and match them to their definitions in Part 1.

Answers should be:

1. clarify–J
 2. glaze–G
 3. thicken–H
 4. coat–C
 5. emulsify–D
 6. leaven–I
 7. bind–A
 8. prevent crystallization–B
 9. color–E
 10. garnish–F.
4. Instruct students to complete Part 2. Students will find most recipes by name on incredibleegg.org if they need help determining how eggs are used in the recipe's preparation. Answers:
 - Breakfast Favorites 1. leaven; 2. leaven; 3. coat.
 - Appetizers 1. bind; 2. clarify; 3. color, garnish.
 - Main Course 1. leaven; 2. bind.
 - Flavorful Sauces 1. emulsify; 2. emulsify.
 - Desserts 1. leaven; 2. leaven, thicken, color; 3. thicken, glaze; thicken, prevent crystallization.

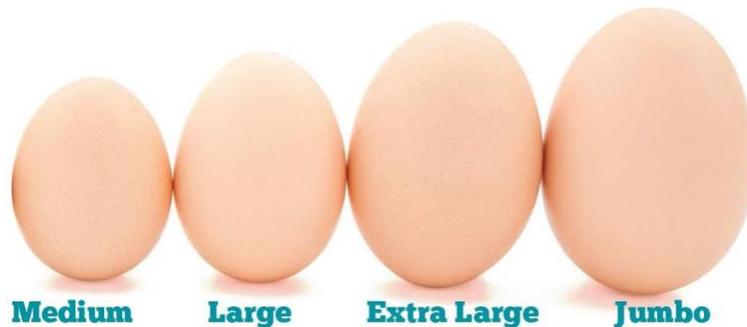
Activity 2: T-egg-nology?

1. Give each student one copy of the *T-egg-nology?* handout.
2. Have students view Chapters 7, 8, and 9 in the [Eggs 101](#) video series. Videos run approximately 3-4 minutes each. Use the explanations below to review students' answers. You may wish to view, and/or suggest that students view, even more advanced technological systems in action by watching the [Farm-to-Table Virtual Field Trip videos](#). Answers:
 1. Feeding hens — Computer-controlled feeding system runs on rails to distribute fresh food equally.
 2. Gathering eggs — Conveyor belts move and position eggs for packaging.
 3. Packaging eggs — Lasers apply date information on package; robots move packages.



3. Have students use the engineering design process graphic to consider how engineers might have arrived at the solutions they saw in the videos to address these three processes. Encourage students to consider and suggest improvements that might use even more advanced technology.

Activity 3: Egg Sizing



1. Give each student one copy of the *Egg Sizing: A Case Study* handout and instruct students to follow the instructions to complete the activity.
 - Note that *Part 1* of this activity requires enough eggs of different sizes (e.g., medium, large, extra large) so that each group of four or five students can work with eggs of two different sizes. Also, provide each group with a scale (digital, if possible). Groups should rotate through the activity so that those waiting their turn to do their investigation can complete conversion charts while they wait.
 - Size conversions (ounce per egg): medium—about 1.75 oz.; large—about 2 oz.; extra large—about 2.25 oz. Students should find that, while there may be slight variations among individual eggs in size and weight, each carton of eggs meets USDA guidelines, ensuring that consumers can always expect to buy eggs with confidence.
 - Part 2: Answers:
 1. Older hens lay larger eggs.
 2. Underweight birds produce smaller eggs.
 3. Stress, heat, overcrowding, and poor nutrition can result in smaller eggs.

Connection to Norman Borlaug

Dr. Borlaug grew up on a farm. There he had multiple responsibilities, one being to collect eggs from the chicken coop! Cooking in the 1920's was very different than how we cook today. Let's compare eggs from then to now.

Students should use their computers to research these various questions.



1. What was the main source of eggs for families in the 1920's? Grocery stores or their farm?
 2. What would families use to cook their eggs?
 3. What was a common recipe in the 1920's that had eggs as its main ingredient?
 4. Where chickens mainly free range or maintained in a coop in the 1920's?
-
1. Today, what is the primary way consumers received their eggs? From the store or their farm?
 2. What do families today use to cook their eggs?
 3. What is a typical recipe that includes eggs today?
 4. Today, are chickens typically free range or maintained in a laying facility?

The way we receive and consume eggs changes in relativity to many things. Have an open discussion with students about why the raising of our eggs, the collection, and the consumption have changed so drastically over time.

Sources/Credits

- ymiclassroom.com/egg-board
- American Egg Board: aeb.org
- Egg Nutrition Center: eggnutritioncenter.org
- Incredible Egg: incredibleegg.org
- The Egg Safety Center: eggsafety.org
- USDA: choosemyplate.gov
- <http://thinkegg.com/index.php/21-2/>

National Agriculture Literacy Outcomes

Food, Health, and Lifestyle

- Demonstrate safe methods for food handling, preparation, and storage in the home. (T3.6-8.a)
- Evaluate food labels to determine food sources that meet nutritional needs (T3.6-8.b)
- Identify agricultural products (foods) that provide valuable nutrients for a balanced diet (T3.6-8.g)
- Identify sources of agricultural products that provide food, fuel, clothing, shelter, medical, and other non-food products for their community, state, and/or nation (T3.6-8.i)

Education Content Standards

Within CAREER

Food Products and Processing Systems Career Pathway

- FPP.01.02
- FPP.02.01



- FPP.02.03

Within HEALTH

Health Standard 5: Demonstrate the ability to use decision-making skills to enhance health.

- 5.8.6

Health Standard 7: Demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

- 7.8.1
- 7.8.2
- 7.8.3

Common Core Connections

Reading: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.R.4

Speaking and Listening: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.SL.1

Writing: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.W.4
- CCSS.ELA-LITERACY.CCRA.W.7
- CCSS.ELA-LITERACY.CCRA.W.8



The state of Iowa is the #1 egg producing state in the United States. Now that is something to be proud of! Iowa also possesses many hogs. In fact, there are 7 pigs in the state for each person. That's a lot of pigs! Let's learn more about what life is like as a Pig on an Iowan Farm.

Pigs on the Farm

Grade: 6th grade

Time: 45 minutes

Purpose:

- Students will explore the basic needs of animals.
- Students will compare and contrast free range raising of pigs versus modern day hog barns.
- Students will create a model of a modern-day pig barn.

Materials:

Interest Approach - Engagement

- A [Field Trip to Ohio Pig Farms](#) video

Activity

- Business-size envelopes, 4 per group
- Paper towel, 1 per group
- toilet paper rolls, 2 per group
- Drinking straws, 2 per group (cut into 8 equal pieces)
- 8.5" x 11" white paper, 1 per group (cut in half)
- Scissors
- Scotch tape
- Markers (optional)
- Extra paper for making fencing, pipes, feed troughs, etc. (optional)

Vocabulary:

- **Environment:** the surroundings or conditions in which a person, animal, or plant lives or operates
- **Farrowing House:** a facility where a litter of pigs is born
- **Finishing Barn:** a barn where pigs live when they are eight weeks old until they are ready for market at six months old
- **Litter:** a group of young animals born one at a time
- **Nursery barn:** a barn where piglets live after they are weaned at three weeks and are moved to the finishing barn at eight weeks old
- **Omnivore:** an animal or person that eats food of both plant and animal origin
- **Piglet:** a baby pig
- **Pork:** meat that comes from pigs
- **Predator:** an animal that preys on others
- **Sow:** a mother pig



- **Wean:** to help a baby to stop feeding on its mother's milk and to eat other foods

Spark Curiosity By...

1. Ask the students, "What is Pork?" (*Pork is meat that comes from pigs. Bacon, pork chops, ham, and sausage are examples of pork products.*)
2. View the video [A field Trip to Ohio Pig Farms](#)
3. Ask the students, "Why are barns important for pigs?" (*Barns protect pigs from weather, disease, and predators.*)
4. Explain to the students that they will be learning more about what pigs need to be healthy and how a pig's environment can protect them.

Agricultural Background

Like humans and other animals, pigs have four basic needs—air, water, food, and shelter. Pigs also need social interaction with other pigs, treatment for injuries and diseases, and space to stand, stretch, and lie down. Pigs raised on farms live in **environments** that are designed to help farmers meet these needs. Barns protect pigs from weather, disease, and **predators**. Farmers provide pigs with fresh air, clean water, nutritious food, and shelter. Pigs are **omnivores**. They eat both plants and animals. Pig feed typically consists of corn and soybean meal mixed with vitamins and minerals. It is a common misconception that farmers feed pigs table scraps or slop. Feeding pigs garbage, raw meat, meat scraps, or restaurant waste puts them at risk and is illegal in the United States.

Computer technology is used to help control the temperature inside the farm buildings where pigs live. Pigs are susceptible to heat and cold stress. Because pigs are unable to sweat to regulate their temperature, farmers use fans and misters to help them stay cool in the summer. Heaters are used to help pigs stay warm in the winter. Pigs also have sensitive skin that is prone to sunburn. Providing shade for pigs is an important part of keeping them healthy and safe.

Newborn pigs are called **piglets**. Piglets are born in a **litter** in a **farrowing house**. They weigh 2-3 pounds when they are born and start walking almost as soon as they are born. Mother pigs are called **sows**. For the first three weeks, piglets nurse from a sow about once every hour. At three weeks old, when the piglets weigh about 15-20 pounds, they are **weaned** and moved to a **nursery barn**. In the nursery barn, piglets are given solid feed and drink water from waterers. The pigs always have access to food and water, but do not overeat because they will only eat until they feel full. At eight weeks old, when the pigs are about 40-60 pounds, they are moved to a **finishing barn**. Pigs go to market when they are six months old and weigh 280 pounds.



Pork is meat that comes from pigs. Bacon, pork chops, ham, and sausage are examples of pork products. Pork fits in the protein section of MyPlate. It is an excellent source of protein, thiamine, niacin, riboflavin, vitamin B₆, and phosphorous and a good source of zinc and potassium.

In this lesson, the students will create a pig barn. View the [Build Your Own Pig Barn](#) tutorial for more information about the activity.

Lesson

1. Ask the students, "What do you need to survive?" (*food, water, air, and shelter*) Ask the students if they think pigs have the same or different needs. Discuss their responses and guide them to the understanding that pigs have the same basic needs as humans. Just like humans, pigs need space, social interaction, and treatment for injuries and disease.
2. Ask the students to imagine that they are farmers who raise pigs. Open up a classroom discussion about how the students would take care of their pigs. Use the following questions to guide the discussion:
 1. How will you keep the animals warm on cold days?
 2. How will you keep them cool on hot days?
 3. What and how will you feed the animals?
 4. What will you do to keep your pigs healthy?
 5. How will you keep your pigs safe from predators?
 6. Who will take care of your pigs every day?
 7. How will the pigs affect the land or air in which they live (soil, odor)?
 8. Can the environment hurt the pigs (weather)?
 9. What other needs do the pigs have, and how will you take care of these needs?

Explain to the students that they are going to design an environment, a pig barn, that will help farmers meet the needs of pigs. Organize students into small groups, or allow students to work individually. Provide each student or group with four business-size envelopes, a paper towel, two toilet paper rolls, two straws cut into eight equal pieces, a piece of white paper cut in half, scissors, and scotch tape.

Use the following instructions to model for the students how to create the barn:

3. **Barn:** Cut an oval hole in one envelope, making a large side window for the barn. This window provides the proper ventilation for the pigs.
4. Cut the paper towel in half and tape it onto the top of the window for the curtain.
5. Cut another envelope in half for the ends of the barn.



6. Tape the ends of the barn to the "sides of the barn" envelopes, one of which has the hole for the window and paper towel curtain, so that you have four sides, or a rectangle.
7. Use the final envelope to create a roof by creasing it in half lengthwise and attaching it with tape to the top of the rectangle.
8. **Food Storage:** Tape four straws, or legs, to each toilet paper roll so that the structures will stand on the legs.
9. Use a half piece of paper, and make a cone shape by twisting and taping the ends. Tape the cone shape on the end of the toilet paper roll without the straw legs.
10. Use the other half piece of paper to make another smaller cone shape and tape it between the straw legs on the other end of the toilet paper roll.

Remind the students that their barn designs should help farmers meet the needs of pigs. Allow time for the students to create fencing, pipes to carry the feed, feeders, water troughs, fans, misters, heaters, etc. Students should add their own innovations to the structure.

Ask the students to share their barns with the rest of the class and explain how their designs help to meet the basic needs of the pigs: *food, water, air, shelter*

Concept Elaboration and Evaluation

After conducting these activities, review and summarize the following key concepts:

- Food, water, air, and shelter are the basic needs of pigs.
- Pigs also need space, social interaction, and treatment for injuries or disease.
- Modern pig barns protect pigs from weather, disease, and predators.
- Pork is a meat that comes from pigs. Bacon, pork chops, ham, and sausage are examples of pork products.

Connection to Norman Borlaug

Norman Borlaug grew up in a time when radios, electricity, in home bathrooms, and telephones were becoming normalized. Although he raised many hogs for food, hog buildings like the ones we built were not constructed yet. Norman rather let his pigs roam around inside a fence. We now call that style of raising pigs as “free range” or “pasture”. Let’s compare these two styles of raising animals.

1. Before you begin, students should brainstorm different elements that pigs need to live. One by one, invite them to write their elements on the whiteboard. Examples may include...
 - Food
 - Water
 - Shelter
 - Shade



- Friends
 - bedding
2. In a separate area on the whiteboard, create a Venn Diagram. One side will be free range and the other will be a pig barn. Using what the students learned about pig barns and what they know about pasture feeding, compare and contrast the two styles of raising pigs. Use the master list of necessity to spark ideas. Be sure to include sow and piglets in the comparison.

It is clear that raising pigs as free range and pigs in a barn is very different. Norman didn't always have it easy when raising his pigs outside, but that was normal for the times! Technology has helped us learn how to build barns that meet the needs of pigs and farmers!

Sources/Credits

- <https://articles.extension.org/pages/68913/transport-and-care-of-pigs>
- <https://www.pork.org/cooking/pork-nutrition/vitamins-and-minerals/>
- <https://www.kfb.org/page/file?path=Files%2Fpage-161%2Fpig-tales%2FPorkFunFacts.pdf>
- <https://realpigfarming.com/15-trivia-winning-facts-about-pigs-6ab00f2d1049>

National Agriculture Literacy Outcomes

Plants and Animals for Food, Fiber & Energy

- Provide examples of specific ways farmers meet the needs of animals (T2.3-5.d)
- Understand the concept of land stewardship and identify ways farmers care for land, plants, and animals (T2.3-5.e)

Science, Technology, Engineering & Math

- Provide examples of science being applied in farming for food, clothing, and shelter products (T4.3-5.d)

Education Content Standards

Within Science

3-5-ETS1: Engineering Design

- 3-5-ETS1-1
- 3-5-ETS1-2

3-LS4-3: Biological Evolution: Unity and Diversity

- 3-LS4-3

Common Core Connections

Speaking and Listening: Anchor Standards

- CCSS.ELA-LITERACY.CCRA.SL.2
- CCSS.ELA-LITERACY.CCRA.SL.4



- CCSS.ELA-LITERACY.CCRA.SL.5
- CCSS.ELA-LITERACY.CCRA.SL.6

Mathematics: Practice Standards

- CCSS.MATH.PRACTICE.MP5