

# Eggs 101

A Video Project  
Teacher's Guide



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**Eggs 101: A Video Project**  
**Video Field Trip Review**  
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# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 1: The Hen — True or False

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. The most common laying hen is the Rhode Island Red. \_\_\_\_\_
2. With commercial hens, their coloring determines the egg color. \_\_\_\_\_
3. Brown eggs are preferred in the New England States. \_\_\_\_\_
4. Besides color, there is a difference between brown eggs and white eggs. \_\_\_\_\_
5. Single-Comb White Leghorns have a much bigger body size compared to other hens. \_\_\_\_\_
6. Disease resistance is a desirable genetic trait. \_\_\_\_\_
7. The ovary and the oviduct make up the hen's reproductive system. \_\_\_\_\_
8. Just before laying, the egg turns so it will be laid small end first. \_\_\_\_\_
9. The shell membranes are formed in the oviduct. \_\_\_\_\_
10. The egg shell is made from calcium carbonate. \_\_\_\_\_

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 1: The Hen — True or False Answer Key (Answers in Bold)

1. The most common laying hen is the Rhode Island Red.  
**False – Single-Comb Leghorn**
2. With commercial hens, their coloring determines the egg color.  
**True**
3. Brown eggs are preferred in the New England States.  
**True**
4. Besides color, there is a difference between brown eggs and white eggs.  
**False – other than color, they are the same.**
5. Single-Comb White Leghorns have a much bigger body size compared to other hens.  
**False – they have a relatively small body size.**
6. Disease resistance is a desirable genetic trait.  
**True**
7. The ovary and the oviduct make up the hen's reproductive system.  
**True**
8. Just before laying, the egg turns so it will be laid small end first.  
**False – it will turn large end first.**
9. The shell membranes are formed in the oviduct.  
**False – in the isthmus.**
10. The egg shell is made from calcium carbonate.  
**True**

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 1: The Hen — Fill In The Blank

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. Compared to other hens, Single-Comb White Leghorns reach egg laying maturity \_\_\_\_\_.
2. When raising laying hens, controlled or \_\_\_\_\_ breeding is used.
3. Hatcheries pick the \_\_\_\_\_, \_\_\_\_\_ birds.
4. The names of original brown egg laying breeds include \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
5. If the bird has \_\_\_\_\_ feathers and \_\_\_\_\_, it will lay \_\_\_\_\_ eggs.
6. If the bird has dark \_\_\_\_\_ and \_\_\_\_\_ ear lobes, it will lay \_\_\_\_\_ eggs.
7. In the ovary, thousands of future yolks are called \_\_\_\_\_.
8. Yolks develop in their own sacs called \_\_\_\_\_.
9. The dense, shock absorbing layer is called the \_\_\_\_\_.
10. The egg spends most of its time in the \_\_\_\_\_.
11. Egg formation takes \_\_\_\_\_ to \_\_\_\_\_ hours and begins again in about \_\_\_\_\_ minutes.

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 1: The Hen — Fill in the Blank Answer Key (Answers in bold)

1. Compared to other hens, Single-Comb White Leghorns reach egg laying maturity **early**.
2. When raising laying hens, controlled or **selective** breeding is used.
3. Hatcheries pick the **strongest healthiest** birds.
4. The names of original brown egg laying breeds include **Rhode Island Red, New Hampshire, Plymouth Rock**.
5. If the bird has **white** feathers and **ear lobes**, it will lay **white** eggs.
6. If the bird has **dark** feathers and **red** ear lobes, it will lay **brown** eggs.
7. In the ovary, thousands of future yolks are called **ova**.
8. Yolks develop in their own sacs called **follicles**.
9. The dense, shock absorbing layer is called the **albumen**.
10. The egg spends most of its time in the **uterus**.
11. Egg formation takes **24 to 26** hours and begins again in about **30** minutes.

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 2: The Egg — True or False

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. Eggs contain the lowest quality protein of all foods. \_\_\_\_\_
2. The shell makes up about 50 percent of the total egg weight. \_\_\_\_\_
3. The shell of an egg is not solid. \_\_\_\_\_
4. The color of the yolk depends on what the hen eats. \_\_\_\_\_
5. Grasses are the basis of a hen's diet. \_\_\_\_\_
6. Producers feed all hens exactly the same feed all over the country. \_\_\_\_\_
7. The albumen is also called the egg white. \_\_\_\_\_
8. The albumen contains just over half of the egg's protein. \_\_\_\_\_
9. As an egg cools, the liquid inside expands. \_\_\_\_\_
10. The size of the air cell is used for grading. \_\_\_\_\_

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 2: The Egg — True or False Answer Key (Answers in bold)

1. Eggs contain the lowest quality protein of all foods.  
**False – highest quality**
2. The shell makes up about 50 percent of the total egg weight.  
**False – 9% to 12%**
3. The shell of an egg is not solid.  
**True**
4. The color of the yolk depends on what the hen eats.  
**True**
5. Grasses are the basis of a hen's diet.  
**False - Grains**
6. Producers feed all hens exactly the same feed all over the country.  
**False – Feed type varies across the country.**
7. The albumen is also called the egg white.  
**True**
8. The albumen contains just over half of the egg's protein.  
**True**
9. As an egg cools, the liquid inside expands.  
**False - contracts**
10. The size of the air cell is used for grading.  
**True**

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 2: The Egg — Fill in the Blank

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. Eggs are popular because they are \_\_\_\_\_ with no \_\_\_\_\_ .
2. Eggs come in their own convenient \_\_\_\_\_ .
3. The egg shell is made up of \_\_\_\_\_ .
4. The tiny pores in the shell allow \_\_\_\_\_ and \_\_\_\_\_ out and \_\_\_\_\_ in.
5. The egg yolk makes up about \_\_\_\_\_ of the liquid weight.
6. The \_\_\_\_\_ yellow-orange pigment in the hens' diet determines the \_\_\_\_\_ color.
7. A balanced feed for hens contain \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ .
8. Phosphorus in the feed helps develop strong \_\_\_\_\_ .
9. When laid, an egg is about \_\_\_\_\_ degrees Fahrenheit.
10. When cooled, the \_\_\_\_\_ and \_\_\_\_\_ membranes will separate.

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 2: The Egg — Fill in the Blank Answer Key (Answers in Bold)

1. Eggs are popular because they are **natural** with no **hormones**.
2. Eggs come in their own convenient **packaging**.
3. The egg shell is made up of **calcium carbonate**.
4. The tiny pores in the shell allow **moisture** and **carbon dioxide** out and **air** in.
5. The egg yolk makes up about **34%** of the liquid weight.
6. The **amount of** yellow-orange pigment in the hen's diet determines the **yolk** color.
7. A balanced feed for hens contain **calcium, vitamin D and phosphorus**.
8. Phosphorus in the feed helps develop strong **egg shells**.
9. When laid, an egg is about **105** degrees Fahrenheit.
10. When cooled, the **inner** and **outer** membranes will separate.

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 3: History — True or False

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. Pecking order refers to aggressive birds eating all the food before the other birds can eat it. \_\_\_\_\_
2. The term candling came from looking at the egg's air cell in front of a candle flame. \_\_\_\_\_
3. All eggs are similar in size. \_\_\_\_\_
4. World War I brought about many advances in the poultry industry. \_\_\_\_\_
5. Refrigeration has little effect on an egg's freshness. \_\_\_\_\_
6. Indoor housing improved egg production by decreasing exposure to predators and parasites. \_\_\_\_\_
7. Raised cage systems allowed for better sanitation and more uniform feeding in the hen house. \_\_\_\_\_
8. Midwest producers modified hen houses by enclosing them and adding ventilation. \_\_\_\_\_
9. Enclosed hen houses led to automation such as conveyors to handle eggs. \_\_\_\_\_
10. Improvements to hen houses not only increased production but led to healthier birds. \_\_\_\_\_

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 3: History — True and False Answer Key (Answers in Bold)

1. Pecking order refers to aggressive birds eating all the food before the other birds can eat it.  
**True**
2. The term candling came from looking at the egg's air cell in front of a candle flame.  
**True**
3. All eggs are similar in size.  
**False – eggs vary in size, Extra Large, Large and Medium**
4. World War I brought about many advances in the poultry industry.  
**False – World War II**
5. Refrigeration has little effect on an egg's freshness.  
**False – refrigeration dramatically slows down the egg's aging process**
6. Indoor housing improved egg production by decreasing exposure to predators and parasites.  
**True**
7. Raised cage systems allowed for better sanitation and more uniform feeding in the hen house.  
**True**
8. Midwest producers modified hen houses by enclosing them and adding ventilation.  
**True**
9. Enclosed hen houses led to automation such as conveyors to handle eggs.  
**True**
10. Improvements to hen houses not only increased production but led to healthier birds.  
**True**

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 3: History — Fill in the Blank

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

1. In the early 1900's, most egg farms were still \_\_\_\_\_ systems.
2. Hens living outside encountered two major problems, \_\_\_\_\_ and \_\_\_\_\_.
3. \_\_\_\_\_ eggs can have an air cell up to 3/16 of an inch deep.
4. Size is now determined by the \_\_\_\_\_ of a dozen eggs.
5. An egg at room temperature ages \_\_\_\_\_ in a day than it does in a \_\_\_\_\_ in a refrigerator.
6. Indoor housing prevented parasites like \_\_\_\_\_.

## Eggs 101: A Video Project — Video Field Trip Review

### Chapter 3: History — Fill in the Blank Answer Key (Answers in Bold)

1. In the early 1900's, most egg farms were still **backyard** systems.
2. Hens living outside encountered two major problems, **weather** and **predators**.
3. **Grade A** eggs can have an air cell up to 3/16 of an inch deep.
4. Size is now determined by the **minimum weight** of a dozen eggs.
5. An egg at room temperature ages **more** in a day than it does in a **week** in a refrigerator.
6. Indoor housing prevented parasites like **leg mites**.

## ADDITIONAL INFORMATION FOR CHAPTER 3

### Easy Egg Candler Instructions

- 1- 60-watt sealed beam flood light bulb
- 1- ceramic light base
- 1- lamp cord
- 1- 4 X 4-inch utility box
- 1- Romex connector
- 1- piece of scrap wood for a mounting base
- 1- cardboard box with a 1 inch diameter hole cut in it
- 1- roll of black electric tape to secure wires and insulation

### Construction of Egg Candler

1. Attach 4 x 4-inch box to scrap wood that is used for a base.
2. Punch out one of the access holes on the utility box and run the lamp cord through it leaving 4-5 inches of wire inside the box.
3. Using wire strippers, strip the ends of the wire inside the box about 1-quarter (1/4) of an inch.
4. Tighten connector screws for Romex connector. Make sure lamp cord is secured.
5. Wire lamp cord to the ceramic light base. One wire to the dark screw, one wire to the silver screw. NOTE: It does not matter which wire goes to which screw.
6. Secure the lamp base to the box using screws provided.
7. Install the flood light bulb into the light base.
8. Cut a small hole, approximately 1 inch in diameter, into the cardboard box. This hole will be used to concentrate the light.
9. Put the box over the bulb and put an egg over the hole to start candling.
10. **Remember safety.** Make sure the box is large enough to not come into contact with bulb. The bulb gets extremely hot. Never leave bulb on and unattended.

### Candling Incubated Eggs

Incubated eggs are candled to determine whether they are fertile and, if fertile, to check the growth and development of the embryo. White eggs should be tested for fertility on the third day. Brown shelled eggs on the fifth or sixth day because it is difficult to see the embryo clearly before this time.

## **What to look for when candling**

A small reddish area with blood vessels extending away from it will be visible in fertile eggs. This is the embryo floating around inside the egg, looking like a huge red spider. If the embryo dies, the blood draws away from the embryo and forms what is called a blood ring. All clear eggs and eggs showing blood rings or streaks should be removed from the incubator. If eggs are not candled during the early stages of incubation, it will be difficult to determine whether the egg was fertile; embryos that die early soon decompose and are not easily distinguished from rotten eggs.

### **Biology Standard:**

#### **B1.15.**

Understand and explain that, in biological systems, structure and function must be considered together.

#### **B.1.31.**

Describe how natural selection provides the following mechanism for evolution: Some variation in heritable characteristics exists within every species and some of these characteristics give individuals an advantage over others in surviving and reproducing. Understand that the advantaged offspring, in turn, are more likely than others to survive and reproduce. Also understand that the proportion of individuals in the population that have advantageous characteristics will increase

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 4: Road Trip — Purdue Chapter 5: Road Trip — Egg Farm Chapter 6: Hen House

Name \_\_\_\_\_ Period/Class \_\_\_\_\_ Date \_\_\_\_\_

### True or False:

1. Science has become a crucial part of egg production. \_\_\_\_\_
2. Hen health and social interaction are two areas of continuing scientific research. \_\_\_\_\_
3. Most egg farms in the U.S. have over 1 million hens. \_\_\_\_\_
4. Creighton Brothers Farms was one of the last large egg production companies to change to a cage system. \_\_\_\_\_
5. Today's egg producers are not concerned with bio-security. \_\_\_\_\_

### Fill in the Blank:

6. Chickens will not lay eggs in the \_\_\_\_\_.
7. There is approximately \_\_\_\_\_ egg laying hen for every person in the United States.
8. Hen houses use a \_\_\_\_\_ system to send eggs directly from the chicken to the processing facility.
9. \_\_\_\_\_ refers to keeping pests and diseases away from the flock.
10. \_\_\_\_\_ control the feeding as well as the climate in many of the large egg production houses.

# Eggs 101: A Video Project — Video Field Trip Review

## Chapter 4: Road Trip — Purdue Chapter 5: Road Trip — Egg Farm Chapter 6: Hen House

### Quiz — Answer Key (Answers in Bold)

#### True or False:

1. Science has become a crucial part of egg production.  
**True**
2. Hen health and social interaction are two areas of continuing scientific research.  
**True — Hen behavior in social group situations is an important part of animal science research.**
3. Most egg farms in the U.S. have over 1 million hens.  
**False — Of the several hundred egg farms in the U.S., only around 65 have flocks of 1 million or more laying hens.**
4. Creighton Brothers Farms was one of the last large egg production companies to change to a cage system.  
**True**
5. Today's egg producers are not concerned with bio-security.  
**False: Today's egg producers are very concerned with bio-security and the health of their animals.**

#### Fill in the Blank:

6. Chickens will not lay eggs in the **dark**.
7. There is approximately **1 (one)** egg laying hen for every person in the United States.
8. Hen houses use a **conveyor** system to send eggs directly from the chicken to the processing facility.
9. **Bio-Security** refers to keeping pests and diseases away from the flock.
10. **Computers** control the feeding as well as the climate in many of the large egg production houses.

# Eggs 101: A Video Project — Video Field Trip Review

## CHAPTER 5: Road Trip — Egg Farm Exercise: How would *YOU* grade the Egg?

Eggs are graded for their quality. Look at each of the egg samples below and grade them based upon their characteristics. The chart below will assist you in grading your eggs.

**Grade**  
**AA**

**Description**

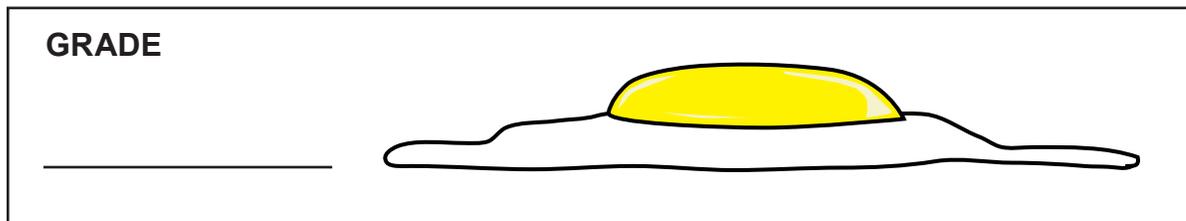
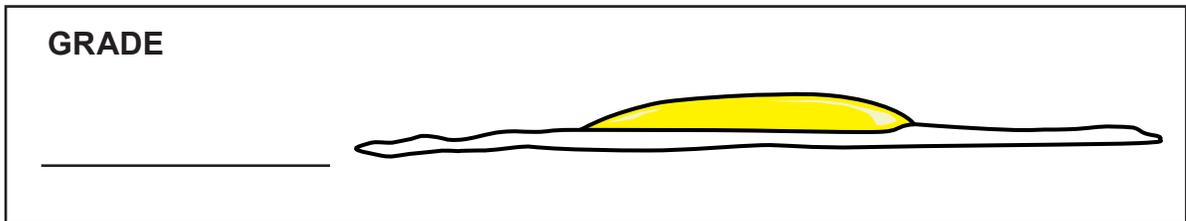
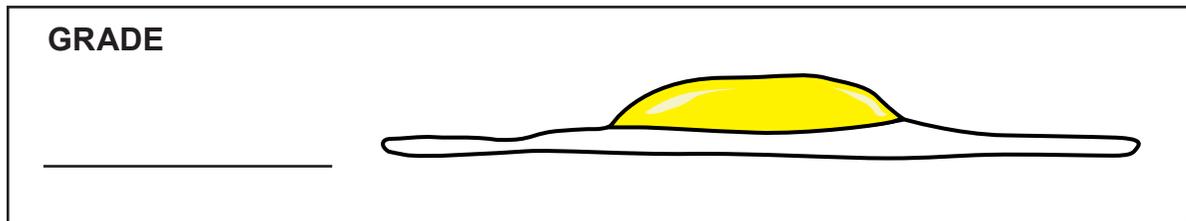
Stands up tall  
Yolk is firm  
Area covered by whites is small

**A**

Yolk is round and tall  
Whites are flatter than AA

**B**

Egg spreads more  
Yolk is flat



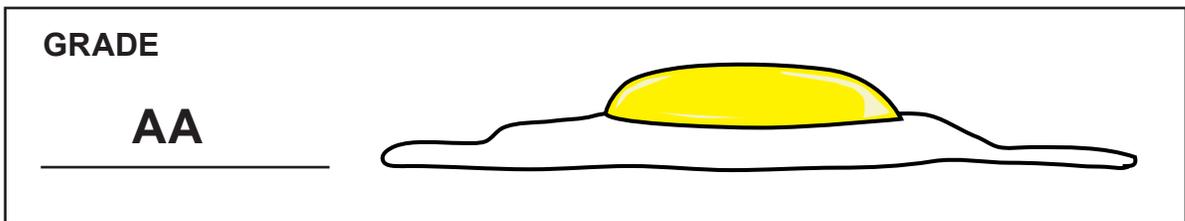
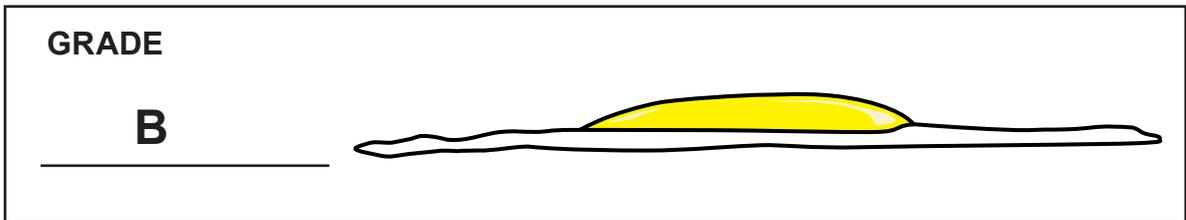
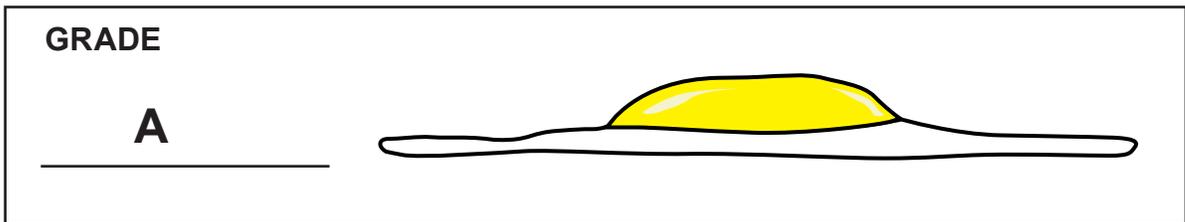
The grade of eggs can change if eggs are not stored correctly or if eggs are kept for a long time in the refrigerator.

# Eggs 101: A Video Project — Video Field Trip Review

## CHAPTER 5: Road Trip — Egg Farm Exercise: How would YOU grade the Egg? Answer Key

Eggs are graded for their quality. Look at each of the egg samples below and grade them based upon their characteristics. The chart below will assist you in grading your eggs.

<b>Grade</b>	<b>Description</b>
<b>AA</b>	Stands up tall Yolk is firm Area covered by whites is small
<b>A</b>	Yolk is round and tall Whites are flatter than AA
<b>B</b>	Egg spreads more Yolk is flat



The grade of eggs can change if eggs are not stored correctly or if eggs are kept for a long time in the refrigerator.

# Eggs 101: A Video Project — Video Field Trip Review

## CHAPTER 5: Road Trip — Egg Farm Exercise: Recipe and Extension Questions

The American Egg Board provides numerous recipes on their website. Here is an easy way to treat your students to the wonderful world of eggs.

For more recipes, visit [www.incredibleegg.org](http://www.incredibleegg.org)

### ***Bacon & Egg Breakfast Rolls***

Try this recipe for a hearty start to the day. Get your Vitamin C by serving with orange segments or adding tomato slices to the sandwich.

#### **Ingredients Needed:**

- 6 uncut Kaiser rolls
- 3 slices bacon
- 1 cup sliced fresh mushrooms
- 1/2 cup chopped onion
- 1/2 cup chopped green pepper
- 6 eggs
- 1/4 cup skim or low-fat milk
- 6 thin slices lean cooked ham
- 6 thin slices reduced-fat Swiss or Muenster cheese or any cheese you wish to use

#### **Other Materials Needed:**

Hot Plate and Oven  
Hot Pads  
Spatula  
Plates, napkins, forks  
10-inch non-stick skillet  
Bread knife or other serrated knife

Slice tops off rolls about 3/4 inch from top. With a fork, scrape out the insides of bottom, leaving about 1/2-inch wall all around. Save crumbs for another use. Set rolls aside.

In 10-inch omelet pan or skillet over medium heat, cook bacon until crisp. Drain well. Crumble. Pour off and discard fat. Add mushrooms, onions and pepper to pan. Cook until tender but not brown, about 5 minutes. Stir in drained bacon.

In medium bowl, beat together eggs and milk until blended. Pour into pan over vegetables. As mixture begins to set, gently draw an inverted pancake turner completely across bottom and sides of pan, forming large soft curds. Continue until eggs are thickened and no visible liquid egg remains. Do not stir constantly.

Spoon egg mixture evenly onto hollows of reserved rolls. Top each roll with 1 slice each of ham and cheese. Broil about 6 inches from heat until cheese is melted, about 3 minutes. Cover with reserved roll tops.

# Eggs 101: A Video Project — Video Field Trip Review

## CHAPTER 5: Road Trip — Egg Farm Exercise: Recipe — Extension Questions

1. How else are eggs used in this recipe?
2. How do eggs influence the other agricultural commodities in our society?
3. What might happen to other agricultural commodities if there were a sudden decline in egg production?
4. Create a flow chart describing how each of the major commodities changes from raw product to useable form in this recipe.

**Example:** Eggs = washed – weighed – packaged – sold at market.

### Academic standards covered:

***Economics:***

E.2.9

***Business Foundations:***

BF.2.6.3 & 4; 4.5.1 & 2

***Advanced Foods and Nutrition:***

AFN.4.1,2,3 & 4

**Following are standards-based lessons  
to use in the application of the  
Eggs 101: A Video Project Video Field Trip  
to Economics, Agriculture, Business, and Science**



## What is Economics?

In today's economic society, there are several ways to define economics. Each definition describes a unique system and each system has a specific way of defining the way goods and services are produced and made available to the consumer. View the following definitions for economics:

- Economics is the study of scarce resources among competing alternatives.
- Economics is the study of how individuals and nations make choices about how to use scarce resources to fulfill their wants.
- Economics is the study of how society allocates scarce resources and goods.
- Economics is the study of how to get the most satisfaction for a given amount of money or to spend the least money for a given need or want.
- Economics is the study of how we work together to transform scarce resources into goods and services to satisfy the most important of our wants, and how we allocate these items among ourselves.
- Economics is the study of the decisions involved in producing, distributing, marketing and consuming goods and services in a given area.
- Economics is the study of efficiency to overcome effects of scarcity to satisfy the wants and needs of consumers.
- Economics is defined as the science of allocating scarce resources, such as land, labor, capital and management, among different and competing choices and utilizing them to best satisfy people's wants.
- Economics is a social structure that studies how producer, consumers and societies decide among alternative uses of scarce resources in production, exchange and consumption.

## Class Activity

Read the nine definitions of economics. Referring to the egg industry, choose the definition that makes the most sense to you and write a paragraph to explain why.

Compare the definitions and explain what they have in common.

### **Economic Standard:**

#### **E.1.1.**

Define each of the productive resources (natural, human, capital) and explain why they are necessary for the production of goods and services.

#### **E.1.2.**

Explain how consumers and producers confront the condition of scarcity, by making choices which involve opportunity, costs and tradeoffs.

#### **E.1.3.**

Identify and explain broad economic and social goals, such as freedom, efficiency, equity, security, growth, price stability, and full employment.

#### **BF 2.4.1**

Identify and contrast different economic systems.

#### **BF 2.4.2**

Discuss advantages and disadvantages of different types of economic systems.

#### **BF 2.4.3**

Describe the economic roles (citizen, worker, consumer) and illustrate how they interact.

#### **BF 2.4.4**

Explain how cultural traditions and customs influence economic behavior in societies.

## What Do You Want?

We all have things that we *want*, such as a new car, a new CD or a shopping spree. Then there are things that we *need*. How do we define what is *needed* and what is *wanted* in our lives?

### Class Activity:

List five needs and five wants that you have as an individual. As a class, share these lists and compile the results. Are your needs and wants in agreement with everyone in the class? Write a paragraph explaining why people's needs and wants may be the same and different.

Now take on the role of an egg producer. What needs and wants are important to your business? Make a list of five needs and five wants pertinent to your business. Compare your list with your classmates. Can you defend your lists?

### Economic Standard

#### E.1.2

Explain how consumers and producers confront the condition of scarcity, by making choices which involve opportunity costs and tradeoffs.

#### BF 2.1.1

Define and give examples of economic wants and needs.

#### BF 2.1.2

Identify the resources that are used to satisfy economic wants and needs.

#### BF 2.1.3

Explain how economic wants and needs are satisfied.

## How Would YOU Do It?

Have you ever been told, “If you can do it better, then why don’t you?” In economics, that is the premise for many people taking on the task of starting their own business. If you do take on that challenge, there are three basic questions you must answer:

- What should be produced and how much of it should be produced?
- How should we produce it?
- Who should get the product and how much of it should they get?

Along with the three basic questions, entrepreneurs must look at other markets in their areas and decide how to best fit in to their local economy. Can they be competitive with traditional goods or should they find a niche product to be competitive?

### Group Activity:

In small groups, develop a plan to start an egg business. Answer the three basic economic questions.

Create a company name and logo for your egg business.

#### **Economic Standard:**

##### **E.1.7.**

Compare and contrast how the various economic systems (traditional, market, command, mixed) answer the questions: What to produce? How to produce the product? For whom to produce the product?

##### **BF 2.2.2**

Demonstrate understanding of rational economic decision making by explaining the costs and benefits of alternative choices in a given situation.

## More Egg-stension Activities

Select and research one of the six economic systems (traditional, capitalism, fascism, socialism, communism, or mixed economy). Write a short essay defending the economic system you favor. Include in your essay key strengths and weakness to both the national economy and the consumer.

### **Economic Standard:**

#### **E.1.7**

Compare and contrast how the various economic systems (traditional, market, command, mixed) answer the questions: What to produce? How to produce the product? For whom to produce the product?

Compare and contrast the uses of free range production versus cage system production. How could you market one or the other to promote sales?

### **Economic Standard:**

#### **E.1.9**

Use a production possibilities curve to explain the concepts of choice, scarcity, opportunity cost, tradeoffs, unemployment, productivity, and growth. Give a class presentation of how supply and demand could effect the wholesale and retail price of eggs. (Note: An example would be “mad cow disease” in beef production.)

### **Economic Standard:**

#### **E.2.1**

Define supply and demand.

#### **E.2.2**

Identify factors that cause changes in market supply and demand.

### **Business Foundations:**

#### **BF 2.6.1**

Describe supply and demand.

- Using the egg industry, identify as many factors of production as possible that were used in making the product. Classify each factor as a natural resource, human service (labor), manufacture resource (capital) or management. Share the information you gathered in a chart for the class to see.

### **Economic Standard:**

#### **E.1.1**

Define each of the productive resources (natural, human, capital) and explain why they are necessary for the production of goods and services.

## Applied Economics Exercises: Exercise 1

In your egg production facility, you need to purchase a new candling and sorting machine to more efficiently sort your eggs. A brand new machine will cost you \$25,000. You also have an opportunity to purchase a used machine from another facility that will also meet your needs. The used machine will cost \$15,000. Your wholesale price for eggs is \$0.08 per egg. You have been approved for a ten year loan at a 3% annual percentage rate.

- A) What is the total cost of the new machine?
- B) What is the total cost of the used machine?
- C) How many eggs would you have to produce to cover the cost of the new machine?
- D) How many eggs would you have to produce to cover the cost of the used machine.
- E) Which machine would you choose. Explain your answer.

### Economic Standard:

#### E.2.6

Explain the function of profit in a market economy as an incentive for entrepreneurs to accept the risks of business failure.

#### E.2.12

Illustrate how investment in factories, machinery, new technology and the health, education, and training of people raises productivity and future standards of living.

#### E.6.8

Formulate a credit plan for purchasing a major item comparing different interest rates.

### Integrated Math Standard:

#### IM.1.2.2

Solve equations and formulas for a specified variable.

### Business Foundations:

#### BF 2.2.2

Demonstrate understanding of rational economic decision-making by explaining the costs and benefits of alternative choices in a given situation.

#### BF 2.3.5

Analyze the impact of technology on productivity.

#### BF 5.2.1

Identify alternative sources for purchases.

#### BF 5.2.2

Explain and apply different suppliers' prices in relationship to quality.

#### BF 5.2.3

Use published consumer resources to collect information for making buying decisions.

#### BF 5.2.4

Identify and apply the steps in a rational decision-making process in implementing an effective buying decision.

## Applied Economics Exercises: Exercise 2

Your production facility is planning to expand. A new hen house is being proposed to house an additional 1000 laying hens in a cage system. Assume the total space required for each hen is three square feet. The wholesale price for eggs is \$0.08 per egg. Assume average egg production per hen is 260 eggs per year.

The contractor has quoted a price of \$62.00 per square foot to construct the building which includes plumbing and electrical work. Also assume you need 150 square feet for office and washroom space as well as 200 square feet for climate control machinery.

- A) How many square feet will your building have to be to accommodate the 1000 laying hens?
- B) How much will the new structure cost to build?
- C) Given the price and average production, how long would the new hens take to pay for the new structure?

### **Economic Standard:**

#### **E.2.6**

Explain the function of profit in a market economy as an incentive for entrepreneurs to accept the risks of business failure.

#### **E.2.12**

Illustrate how investment in factories, machinery, new technology, and the health, education, and training of people increases productivity and raises future standards of living.

### **Business Foundations:**

#### **BF 2.3.5**

Analyze the impact of technology on productivity.

## Applied Economics Exercises: Exercise 3

You are in charge of hiring a new general employee for your egg farm and the starting wage is \$22,000 per year. You also pay an additional \$2,000 to cover benefits.

- A) How many eggs, at \$0.07 per egg, would have to be produced to pay the employee and their benefits?
- B) If your hens lay an average of 265 eggs per year per hen, how many hens would you have to have to pay the employee?
- C) How much does the employee make per hour?

### Economic Standard:

#### E.3.11

Describe how the earnings of workers are determined by the market value of the product produced and workers' productivity.

## Applied Economics Answer Key

1. A. Formula  $I = P r t$

I = Interest Paid

P = Principal amount of Loan

r = Interest rate

t = Time in years

a.  $I = (25,000) (0.03) (10)$

b.  $I = 7,500$

c. Total Cost =  $25,000 + 7,500 = 32,500$

B. Use Same Formula

a.  $I = (15,000) (.03) (10)$

b.  $I = 4,500$

c. Total Cost =  $15,000 + 4,500 = 19,500$

C.  $32,500 / .08 = 406,250$  total eggs or 40,625 eggs per year for 10 years.

D.  $19,500 / .08 = 243,750$  total eggs or 24,375 eggs per year for 10 years.

E. Student answers will vary given their defense of their decision.

2. A. (Number of hens) (Square foot per hen)

a.  $1000 * 3 = 3000$  square feet of space for the hens

B.  $3350 \text{ sq. ft.} * \$62 = \$207,700$

C.  $1000 \text{ hens} * 260 \text{ eggs per year} = 260,000 \text{ eggs}$

a.  $260,000 * \$0.08 = \$20,800$  per year.

b.  $\$207,700 / \$20,800 = \text{Approx. } 10 \text{ years to pay off structure.}$

3. Wage is \$24,000 total paid by employer.

a.  $\$24,000 / 0.07 = 342,857$  eggs per year.

b.  $342,857 / 265 = 1294$  laying hens to pay employee.

c.  $\$22,000 / 40 \text{ hours per week} / 52 \text{ weeks} = \$10.57$  per hour.

For more facts about  
egg production and nutrition  
around the world:

**American Egg Board**  
[www.incredibleegg.org](http://www.incredibleegg.org)



**The incredible edible egg™**



A hand holding a white egg against a blue background with a keyboard overlay.

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