



An Egg's Journey From the Farm
to our Tables

Teacher's Guide

the incredible egg

AEB.org

Teacher's Guide for Eggs 101 Videos: An Egg's Journey From the Farm to our Tables

Designed for the classroom, the American Egg Board has developed a collection of short videos that showcases an egg's journey from the hen house to our plates. This flexible series includes seven videos that give an in-depth explanation of an egg's journey; from the barn experience to environmental management and from the egg itself to the homes of families nationwide.

These videos are suitable for learners in the middle grades (4th-8th). They introduce health and nutrition concepts as well as information about sustainable agricultural practices. They encourage vocabulary acquisition, expose students to career opportunities, and demonstrate ways in which technology has changed agriculture over time. Therefore, they support national learning standards in science and the social studies:

- **Family and Consumer Science Standards 3.0**
- **National Curriculum Standards for Social Studies**
- **Next Generation Science Standards**
- **STEM & The International Technology Association**
- **National Council for Economic Education Voluntary Content Standards**

Examples of video review quizzes and supported standards pulled from the above sources appear after each related group of videos and are included on the following pages.

Additionally, these videos provide foundational information on which a variety of lessons could be designed to strengthen middle grade Common Core Standards in language arts and math.

Example:

Assignment: Write a paragraph about modern barns or hen houses.

Grade 7 Common Core English Language Arts: Comprehension & Collaboration

Analyze the main ideas and supporting details presented in diverse media formats and explain how the ideas clarify a topic, text, or issue under study.

OR

Assignment: If an average hen lays an egg every 24-26 hours, how many eggs will 10 hens produce in a week?

Grade 4 Common Core Math: Operations & Algebraic Thinking

Multiply or divide to solve word problems involving multiplicative comparison, eg. by using a drawing and equations with a symbol for the unknown number to represent the problem.

We hope you can put these resources to use in your classrooms!



Overview: A brief explanation of the laying, cleaning and packaging steps eggs take before reaching grocery stores and restaurants nationwide.

Fill in the Blank

1. Egg production begins in the **(barn or hen house)**.
2. Healthy hens have constant access to **(food, water, fresh air)** and **(food, water, fresh air)**.
3. Some eggs have **(brown/white)** shells and some eggs have **(brown/white)** shells.
4. After eggs are collected and washed, they are **(candled, sorted, graded, or packaged)** and **(candled, sorted, graded, or packaged)**.
5. Packaged eggs are shipped to **(restaurants, groceries or businesses.)** or **(restaurants, groceries or businesses).**

True or False

1. Egg production begins with healthy, well-cared for hens. **True**
2. Fresh eggs are always collected automatically. **False – usually. Eggs are collected automatically in the majority of barns. In cage free, free range and pasture-raised farms, some eggs may need to be collected by hand**
3. Farmers are not able to look inside eggs without cracking them. **False – candling allows farmers to see inside eggs**
4. Sometimes eggs are spot-checked by the United States Department of Agriculture (USDA). **True**
5. Eggs are immediately refrigerated after they are packed into egg cartons. **True**

Extension: What questions do you have about barns, hens, eggs, environmental management and the kinds of "eggsperts" involved in the production of eggs in the United States?

This video supports the National Curriculum Standards for Social Studies Theme 7: Production, Distribution and Consumption: Ask and find answers to questions about the production, distribution, and consumption of goods and services in the school and community.

More details are available here: <https://www.socialstudies.org/standards/strands>.



Barns: Hen houses have evolved over time and are still changing today. There are many different styles of barns, but each is designed to keep hens safe and healthy.

Fill in the Blank

1. Over time, chicken coops, hen houses and **(barns)** have been improved to keep hens healthy.
2. Hens living outdoors encounter two major challenges: **(weather)** and **(predators)**.
3. All barns are well-ventilated and provide natural or artificial **(light)**.
4. Most barns use conveyor belts to move **(eggs)** and **(manure)**.
5. Newer barns allow egg farmers to control the **(temperature)** during cold winters and hot summers.

True or False

1. The majority of today's egg-laying hens are kept indoors. **True**
2. Indoor housing improves egg production by decreasing exposure to predators and allowing temperature to be controlled. **True**
3. There is not a difference between cage-free and free-range hen housing. **False – cage-free hens move around freely in the barn while free-range hens have access to the barn and outdoors, by choice**
4. All barns should be well-ventilated and provide natural or artificial light. **True**
5. Eggs are all that is moved from barns on a conveyor belt. **False – manure belts take waste out of the barn (other things, like feeding and climate, could be automated too)**
6. Hen houses have evolved over time and continue to evolve in the 21st century. **True**

Extension - In addition to moving eggs and manure on conveyor belts, what other things might be automated in barns? **feeding, climate (temperature, light)**

The video about barns supports lessons that address these ITEA standards, part of the Next Generation Science Standards.

International Technology Education Association

Middle Grades (6th-8th) ITEA 6D: Throughout history new technologies have resulted from the demands, values and interests of individuals, businesses, industries and societies.

Middle Grades (6th-8th) ITEA 15F: Students will develop an understanding that technological advances in agriculture directly affect the time and number of people required to produce food for a large population.



Hen Health: To ensure safe, wholesome eggs, it is important to keep hens healthy. Egg farmers enforce biosecurity on their farms and require team members and visitors to follow strict rules when entering the farm.

Fill in the Blank

1. The rules and processes enforced on egg farms to keep disease out of barns is called **(biosecurity)**.
2. Biosecurity may include procedures like showering before entering barns, **(clean clothes, shoe covers, hand sanitizer, sanitizing vehicles)** and **(clean clothes, shoe covers, hand sanitizer, sanitizing vehicles)**.
3. The "Egg Rule" was created to ensure **(bacteria)** is not introduced to or transferred between hens and barns.
4. Barns protect hens from **(predators)** and other wild birds.
5. Today's egg farms need **(highly-trained)** employees to help keep hens safe and healthy.

True or False

1. Today's egg producers are not concerned with biosecurity. **False – biosecurity offers important rules and processes to limit germs and disease in barns**
2. All U.S. egg farms have on-staff veterinarians. **False – many egg farms have on-staff veterinarians while others rely on consulting veterinarians to keep flocks healthy**
3. Most farms have clear expectations for highly-trained employees who follow specific animal care "codes of conduct." **True**
4. The Egg Rule was developed in 2009 by the U.S. Food & Drug Administration to prevent diseases on egg farms? **True**
5. Healthy hens are very quiet in the morning. **False – healthy hens are usually very vocal when the lights are turned on**

Extension: How are biosecurity and hen health related?

These three videos (Hen Health, Hens & Hens: The Making of An Egg) support STEM and Next Generation Science Standards for life science.

Grade Level

Life Science Standards

- | | |
|-----|--|
| 5 | LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers and the environment. |
| 6-8 | LS1-4: Use arguments based on empirical evidence and scientific reasoning to support an explanation of how characteristic animal behaviors affect the probability of successful reproduction. |
| 6-8 | LS1-5: Construct an explanation based on evidence for how environmental and genetic factors influence the growth of organisms. |



Hens Part 1: There are many different breeds of hens, but each produce eggs with the same genetic make-up and nutritional value.

Fill in the Blank

1. Egg laying hens are all **(female)**. Roosters are all male.
2. Egg farmers select strong healthy birds with good egg-laying records and genetics that help with things like **(resisting disease)**.
3. Before hens are mature, they are first called **(chicks)** and then **(pullets)**.
4. Hens are ready to lay eggs around **(six months)** of age.
5. Hens are fed a **(grain)** - based diet.

True or False

1. The most common eggs come from the Rhode Island Red. **False – the Single-Comb Leghorn**
2. Usually, an eggshell's color is determined by the color of the hen that laid it. Brown eggs normally come from brown hens, and white eggs normally come from white hens. **True**
3. The earlobe color of a hen is another way to determine eggshell color. **True**
4. Regardless of shell color, all eggs have the same genetic makeup and nutritional value. **True**
5. Before they are ready to lay eggs, hens are called pullets. **True**

Extension: Why might hen lifespans be longer than ever?

(Egg farmers provide consistent, vitamin-enriched diets, and follow animal welfare practices, including healthcare and vaccinations, to prevent disease.)

These three videos (Hen Health, Hens & Hens: The Making of An Egg) support STEM and Next Generation Science Standards for life science.

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Hens: The Making of an Egg: A hen's biological makeup is what allows her to produce many eggs in her lifetime.

Fill in the Blank

1. The albumen, or egg white, develops in the hen's **magnum**.
2. The egg is laid through the hen's **vent**.

True or False

1. Every hen is born with tiny yolks inside her ovary. **True**
2. The process of creating a single egg takes less than 24 hours. **False – 24-26 hours**
3. The shell membranes are formed in the oviduct. **False – in the isthmus**
4. The egg spends most of its time in the hen's uterus, or shell gland, where the shell is formed and the color is defined. **True**

These three videos (*Hen Health*, *Hens & Hens: The Making of An Egg*) support STEM and Next Generation Science Standards for life science.

Grade Level

Life Science Standards

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|-----|--|
| 5 | LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers and the environment. |
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Eggs Part 1: Hens in the United States produce more than 75 billion eggs each year. Eggs can vary in size, but each contains the same three parts and an abundance of nutrients.

Fill in the Blank

1. Eggs all share the same basic characteristics. Name two characteristics that all eggs share: **(oval shape, white or brown shell, yolk, albumen/egg white)** and **(oval shape, white or brown shell, yolk, albumen/egg white)**.
2. The color of the **(yolk)** depends on what the hen eats.
3. The size of eggs vary, based on the **(size)** and **(age)** of the hen laying them.
4. Albumens, or egg whites, are at their best when they are **(thick)** and **(firm)**.
5. Grade AA and A eggs normally are sold at grocery stores, while Grade B eggs are made into liquid eggs or **(Frozen eggs, protein powder)**.

True or False

1. On average, hens produce about 365 eggs per year. **False – most hens produce between 250-300 eggs per year**
2. There is approximately one egg-laying hen for every person in the United States. **True**
3. Yolks contain all the protein found in an egg. **False – yolks contain about half the protein**
4. The eggshell is made of calcium carbonate. **True**
5. At about 17 cents per egg, eggs are the most affordable source of protein on the planet. **True**

Extension: According to USDA guidelines, eggs are graded and labeled as AA, A, and B. Find out what characteristics these grades are based on.

(For example, U.S. Grade AA eggs are nearly perfect. The whites are thick and firm and the yolks are free from any defects. The shells are clean and without cracks.)

This video supports learning activities that address the Family and Consumer Science National Standards.

Family and Consumer Sciences National Standards are outcomes; that is, expectations of what students should know and be able to do upon completion of a sequence of courses in a defined pathway/program of study/or upon graduation. As local curriculum is developed, the national standards may be utilized to develop appropriate grade level indicators of student achievement in earlier grade levels.

*National Standards for Family and Consumer Sciences:
Food Production and Services*

8.1: *Analyze career paths within the food production and/or food service industries.*

*National Standards for Family and Consumer Sciences:
Food Science, Dietetics & Nutrition*

9.4: *Apply basic concepts of nutrition in a variety of settings.*

*National Standards for Family and Consumer Sciences:
Nutrition & Wellness*

14.4 *Evaluate factors that affect food safety from production through consumption.*



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.



Eggs Part 2: Eggs go through many different steps to ensure they are safe in the days before they reach grocery store shelves. Consumers also play an important role in safe egg handling practices.

Fill in the Blank

1. The risk of contracting Salmonella from eggs today is very **low**.
2. On each egg carton, there is a three-digit number called the **Julian date** that indicates the exact day of the year the eggs were packed.
3. After purchasing eggs, consumers are responsible for practicing egg safety, including proper **storage, handling** and **cooking**.
4. When preparing eggs, it is important to remember to wash **hands** and **utensils** to avoid cross-contamination or raw egg consumption.

True or False

1. After eggs leave the barn, the first step is candling to check for imperfections. **False – eggs are first washed and sanitized, then candled**
2. It takes about 48-72 hours from the time an egg is laid before it leaves for a grocery store or restaurant. **True**
3. The Egg Safety Rule offers guidelines for farmers for the safe production, storage and transportation of eggs, but consumers play a part in safe egg handling too. **True**
4. Eggs are regularly tested for Salmonella. Heat destroys bacteria, so it is important for consumers to cook eggs to 160°F or until egg whites are firm. **True**
5. Eggs can remain fresh for four to five weeks past their pack date when properly stored in the refrigerator. **True**

Extension: Eggs are typically sold in packages of a dozen - do some quick research to learn why. What other things are often packaged as twelve?

(donuts, roses, pencils...).



Environmental Management: Egg farmers work hard to recycle resources used in their barns. Over the past 50 years, egg farmers have been able to greatly reduce their environmental footprint by following strict environmental management guidelines.

Fill in the Blank

1. Conveyers under cages catch **(manure)** and allow it to dry, which reduces rodents and flies, and makes it easier to store.
2. Egg farmers work hard to **(recycle)** resources on their farms.
3. Farmers like using manure as fertilizer because it is rich with **(nutrients)** that help crops grow.
4. Manure is not the only thing that can be recycled in the egg production process. **(Water)** used for drinking and cleaning eggs can be recycled too.
5. Since 1960, egg production has increased nearly **(30 / thirty)** percent in the United States, while the overall environmental footprint has been reduced.

True or False

1. Egg farmers need to know how to care for hens AND natural resources, like land, air and water. **True**
2. Farmers use sophisticated methods for removing manure from barns, which only improves the air quality inside hen houses. **False – removing manure also helps reduce odor and pests**
3. U.S. egg farmers support grain farmers in many ways. Egg farmers purchase grains from crop farmers to feed to their hens and later, hens' manure is collected by egg farmers and sold to crop farmers as a fertilizer for their crops. **True**
4. Farmers can apply manure to crops any time of year. **False – farmers must follow rules for fertilizing, and apply manure only at certain times, when the soil can absorb the nutrients so manure does not run off into streams or lakes**
5. Today, it takes nearly a third less water (32%) to produce a dozen eggs than it did in 1960. **True**

Extension: Explain one way science has become a crucial part of egg production.

Technological advances, like cameras that view eggs from every angle and sensors that tap and listen for cracks, help quality assurance. OR Improved recycling processes for things like manure and water on egg farms reduce waste and conserve resources.

This video supports STEM and Next Generation Science Standards for earth and life science.

Grade Level

5

Earth Science Standards

ESS3-1: Obtain and combine information about ways individuals and communities use science ideas to protect the Earth's resources and environment.

Grade Level

6-8

Life Science Standards

LS2-5: Evaluate competing design solutions for maintaining Biodiversity and ecosystem services, such as water purification, nutrient recycling and prevention of soil erosion.



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:

1. Economics is the study of scarce resources among competing alternatives.
2. Economics is the study of how individuals and nations make choices about how to use scarce resources to fulfill their wants.
3. Economics is the study of how society allocates scarce resources and goods.
4. 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.
5. 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.
6. Economics is the study of the decisions involved in producing, distributing, marketing and consuming goods and services in a given area.
7. Economics is the study of efficiency to overcome effects of scarcity to satisfy the wants and needs of consumers.
8. 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.
9. 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

This activity supports the National Curriculum Standards for Social Studies Theme 7: Production, Distribution and Consumption: Ask and find answers to questions about the production, distribution, and consumption of goods and services in the school and community.

<https://www.socialstudies.org/standards/strands>

It also begins to coordinate the following instructional resources with the Voluntary National Content Standards for Economics.

<https://www.councilforeconed.org/resource/voluntary-national-content-standards-in-economics>

Additionally, these economic lessons strengthen middle grade Common Core Standards in language arts and math.



We all have things that we want, such as a new car, a new game 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

Content Standard 1: Scarcity

Students will understand that: productive resources are limited. Therefore, people cannot have all the goods and services they want; as a result, they must choose some things and give up others.

Students will be able to use this knowledge to: identify what they gain and what they give up when they make choices.

Benchmarks: Grade 4

At the completion of Grade 4, students will know that:

1. People make choices because they can't have everything they want.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

4. The evaluation of choices and opportunity costs is subjective; such evaluations differ across individuals and societies.



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

Content Standard 3: Allocation

Students will understand that: Different methods can be used to allocate goods and services. People acting individually or collectively must choose which methods to use to allocate different kinds of goods and services.

Students will be able to use this knowledge to: evaluate different methods of allocating goods and services, by comparing the benefits to the costs of each method.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

3. People in all economies must address three questions: What goods and services will be produced? How will these goods and services be produced? Who will consume them?

Content Standard 14: Entrepreneurship

Students will understand that: entrepreneurs take on the calculated risk of starting new businesses, either by embarking on new ventures similar to existing ones or by introducing new innovations. Entrepreneurial innovation is an important source of economic growth.

Students will be able to use this knowledge to: identify the risks and potential returns to entrepreneurship, as well as the skills necessary to engage in it. Understand the importance of entrepreneurship and innovation to economic growth, and how public policies affect incentives for and, consequently, the success of entrepreneurship in the United States.

Benchmarks: Grade 4

At the completion of Grade 4, students will know that:

1. Entrepreneurs are individuals who are willing to take risks, to develop new products, and start new businesses. They recognize opportunities, like working for themselves, and accept challenges.
2. Entrepreneurs and workers often are innovative. They attempt to solve problems by developing and marketing new or improved products and processes.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

1. Entrepreneurs compare the expected benefits of entering a new enterprise with the expected costs.
5. In addition to profits, entrepreneurs respond to other incentives, including the opportunity to be their own boss, the chance to achieve recognition, and the satisfaction of creating new products or improving existing ones. In addition to financial losses, other disincentives to which entrepreneurs respond include the responsibility, long hours, and stress of running a business



1. 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.
2. 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?
3. Compare and contrast the uses of free-range production versus cage system production. How could you market one or the other to promote sales?
4. 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.)
5. 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.
6. Define each of the productive resources (natural, human, capital) and explain why they are necessary for the production of goods and services.

ECONOMIC STANDARD

Content Standard 3: Allocation

Students will understand that: different methods can be used to allocate goods and services. People acting individually or collectively must choose which methods to use to allocate different kinds of goods and services.

Students will be able to use this knowledge to: evaluate different methods of allocating goods and services, by comparing the benefits to the costs of each method.

Benchmarks: Grade 4

At the completion of Grade 4, students will know that:

1. No method of distributing goods and services can satisfy all wants.
2. There are different ways to distribute goods and services (by prices, command, majority rule, contests, force, first-come/first-served, sharing equally, lottery, personal characteristics, and others), and there are advantages and disadvantages to each.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

2. There are essential differences between a market economy, in which allocations result from individuals making decisions as buyers and sellers, and a command economy, in which resources are allocated according to central authority.
4. National economies vary in the extent to which they rely on government directives (central planning) and signals (prices) from private markets to allocate scarce goods, services, and productive resources.



In your egg production facility, you need to purchase a new candling and sorting machine to sort your eggs more efficiently. A 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 10-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

Content Standard 2: Decision Making

Students will understand that: effective decision making requires comparing the additional costs of alternatives with the additional benefits. Many choices involve doing a little more or a little less of something; few choices are “all or nothing” decisions.

Students will be able to use this knowledge to: make effective decisions as consumers, producers, savers, investors, and citizens.

Benchmarks: Grade 4

At the completion of Grade 4, students will know that:

1. Choices involve getting more of one thing by giving up something else.
2. A cost is what you give up when you decide to do something. A benefit is what satisfies your wants.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

2. Marginal benefit is the change in total benefit resulting from an action. Marginal cost is the change in total cost resulting from an action.



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

Content Standard 14: Entrepreneurship

Students will understand that: entrepreneurs take on the calculated risk of starting new businesses, either by embarking on new ventures similar to existing ones or by introducing new innovations. Entrepreneurial innovation is an important source of economic growth.

Students will be able to use this knowledge to: identify the risks and potential returns to entrepreneurship, as well as the skills necessary to engage in it. Understand the importance of entrepreneurship and innovation to economic growth, and how public policies affect incentives for and, consequently, the success of entrepreneurship in the United States.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

3. Entrepreneurs (as well as other sellers) earn profits when the revenues they receive from selling the products they sell are greater than the costs of production.
4. Entrepreneurs (as well as other sellers) incur losses when the revenues they receive from selling the products they sell do not cover the costs of production.

Content Standard 15: Economic Growth

Students will understand that: investment in factories, machinery, new technology, and in the health, education, and training of people stimulates economic growth and can raise future standards of living.

Students will be able to use this knowledge to: predict the consequences of investment decisions made by individuals, businesses, and governments.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

4. Increases in productivity can result from advances in technology or increases in physical or human capital.



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

Content Standard 13: Income

Students will understand that: income for most people is determined by the market value of the productive resources they sell. What workers earn primarily depends on the market value of what they produce.

Students will be able to use this knowledge to: predict future earnings based on their current plans for education, training, and career options.

Benchmarks: Grade 8

At the completion of Grade 8, students will know the Grade 4 benchmarks for this standard, and also that:

1. Employers are willing to pay wages and salaries to workers because they expect to be able to sell the goods and services that those workers produce at prices high enough to cover the wages and salaries and all other costs of production.



Exercise 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.

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

Exercise 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.

EGGS 101

For more facts about egg farming,
egg nutrition and egg safety, visit:

IncredibleEgg.org

the incredible egg

