



Agriculture: It's a Risky Business

Lesson Title: Agriculture: It's a Risky Business

Subjects: Economics; English Language Arts

Grade Level: Grades 11 & 12

Estimated Time: 2-3 Class Periods

General Goal:

While on the surface the problems presented in each clip seem to be purely ecological, students will uncover the economic consequences of ecological dilemmas throughout the lesson. The devastating consequences of the pests in the videos will allow students the opportunity to apply their knowledge of basic economic concepts to a real world example.

Objectives:

Students will demonstrate comprehension of the following concepts: demand, supply, opportunity cost, and cost-benefit analysis. If you choose to execute the extension, students will also demonstrate comprehension of unemployment and externalities.

Students will apply these concepts to create flow charts demonstrating the possible economic consequences of biological pests.

Students will apply these concepts to discuss the economic costs and benefits of control measures discussed in each clip (biological, physical, and chemical).

Students will debate possible solutions to each problem –utilizing the economics concepts emphasized in this lesson.

Standards: See [Standards](#) document

***America's Heartland* Episode Summaries:**

Episode 504 Clip: *Citrus Concerns*

Citrus Greening Disease is caused by a deadly bacterium that could severely cripple America's citrus industry. For now, research is underway and scientists and growers are aggressively attacking the problems.

Episode 511 Clip: *Hog Hunt*

There's a creature that's proving to be quite destructive for Texas farmers and ranchers – the wild hog. Like Citrus Greening, this biological concern is reaping economic consequences.

Materials:

- *America's Heartland* clips available at americasheartland.org/episodes/index.htm or for purchase at kviestore.org/amhe.html.
- Chart paper and markers for student use
- Technology Equipment (computer with projector and/or TV with DVD player)
- Attachments:
 - For Teacher Reference:
 - [Glossary of Terms](#), [Flow Chart examples](#), [Debate Rubric](#), [Supply and Demand Graphs](#)
 - For Student Use:
 - [Viewing Guides](#), [Debate Cards](#)

Teacher Preparation

- Create a flow chart (with text omitted) either on chart paper, white board, or other media tool that will later be used to be filled out as a class.
- View clips beforehand and download to computer (enables you to view them offline at later time) or purchase DVD copy online.

Procedure:

Introduction/Hook: *(Time Suggestion - 15- 20 minutes)*

- Divide students into groups of 4. Ask each group to list their top five favorite fruits with a price they would be willing to pay for each fruit. Discuss and compare why the prices they listed are the expected prices (should be quite low) and have each group share why they expect to pay those prices and no higher.
- Share with the students that agricultural economics is unique. Producers cannot easily differentiate by brand as is possible in the other industries (e.g. clothing industry) and people expect prices to be low. Also, agriculture, relative to other industries, is greatly impacted by

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fiscal policy, immigration policy, and trade policy (all issues that can be used as jumping off point for future lesson plans). The same laws of supply and demand apply to the agriculture industry that apply to other industries, e.g., automobiles, clothing, etc., except that the agricultural industry is more closely linked to environmental factors and therefore is a high risk industry in comparison. Explain that throughout the next few days, we will be discussing how changes in supply affect the agricultural industry – *How do suppliers respond and what are the broader economic consequences?*

Film Clip: *(Time Suggestion - 15 minutes)*

- *Before viewing* - make sure to download the [Viewing Guides](#) for each student. Each student will need to respond to the questions during the clips.
 - Recommended clips (each are 5 minutes in length):
[americasheartland.org/episodes/index.htm](http://www.americasheartland.org/episodes/index.htm)
 - Clip 1: *America's Heartland*, Episode 504, and "Citrus Concerns." Click on "Citrus Concerns" to play the clip.
 - http://www.americasheartland.org/episodes/episode_504/index.htm
 - Clip 2: *America's Heartland*, Episode 511, and "Hog Hunt." Click on "Hog Hunt" to play the clip.
 - http://www.americasheartland.org/episodes/episode_511/index.htm
- *While viewing* - Depending on your class, you may wish to pause throughout the clips to highlight key vocabulary and concepts. Students will need to complete the viewing guides during the video.
- ***NOTE: You may choose to show the first clip then proceed to the group activity before moving onto the second clip. Make sure to show both clips before moving onto the independent activity.***

Group Activity: *(Time Suggestion - 20 minutes)*

- As a class, ask for volunteers to fill in the blank spaces of the flow chart ([see example](#)) – illustrating the economic effects of the ecological disaster – citrus greening.
- At this time students should begin making connections – at minimum the concepts of demand and supply should appear on the flow chart (see graphs illustrating the concepts for further reference).

Independent Activity: *(Time Suggestion - 45 minutes)*

- Next, divide students into groups (no more than four per group) to create flow charts outlining the hog issue on their own. Each group must create a flow chart with a minimum of 8 sections incorporating the following terms and concepts: supply, demand, and opportunity cost. See [example flow chart](#) for one possible solution.

- Each group will then present their flow charts to the class, explaining the step-to-step progression. At this time, teachers can assess students in terms of their level of understanding.
 - Use the presentation time to discuss the concepts with students and allow students to justify their logic.

Assessment Activity: (*Time Suggestion – Out of class assignment and at least one full class period*)

- Next, tell students that they will be working in groups again to prepare for a class debate. Each group will pull cards out of a jar that say either “citrus” or “hogs.” Groups who chose the same themed card will debate each other (depending on class size, number of cards will vary, but must be an even number). Students will then need to work together to discuss the possible economic consequences of the following solutions to their assigned problem.
 - Citrus – pesticides, biological control (insect), doing nothing, cutting down trees and starting over, other alternative
 - Hogs – hunting, traps, moving out of state, doing nothing, other alternative

Possible Extension: Before moving on with the rest of the activity, introduce the concept of an EXTERNALITY (definition in glossary of terms). Tell students that it may seem simple to come up with a solution, but that they must take into account the hidden costs or benefits not taken into account in the prices of goods – the externalities. For example, pesticides may be cheap, but may leak into a nearby water source affecting water quality, imposing costs. Or, a trap built by one rancher could benefit another nearby, the externality in this case being positive, making the cost of making the trap relatively cheaper.

- They will need to prepare for the costs and benefits of all possible solutions because they will choose cards again before the debate that will identify, for each group, the solution they are debating and their position (pro or con).
 - E.g. If a pair of “hog” groups choose “hunting” – one group will be assigned *pro* and the other *con*. Therefore, they each need to prepare the economic cost and benefits of each solution.
 - You can also elect to have groups choose which solution to debate and let them debate various solutions if time permits.
- Debate winners will be assigned according to the following rubric (Please feel free to create your own rubric as well; this was created as an example and/or guide). Each debate will last no longer than 10 minutes – giving each team five minutes to present their arguments. All students must participate on each team.

Extensions/Suggested Activities:

- If you have the time to take this lesson one step further, use the *America’s Heartland* video to introduce the concept of fiscal policy. How will fiscal policy, such as price floors and subsidies

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affect these farmers? What are the economic consequences of these policies? How is trade affected by fiscal policy? Students can theme their debate around these issues instead of the suggested theme, but this level of knowledge is not assumed or necessary for sufficient execution of this particular lesson.

- Use the clip from *America's Heartland* as inspiration to create your own economics-themed Board Game. All you need is cardboard, markers, index cards, and creative game pieces (anything will work – even old Monopoly game pieces). The game could cover many concepts, but by using a simple snake pattern, with cards and symbols that direct players on how to proceed, you will be able to test the knowledge attained from the lesson in a fun and interactive way!
 - Basic Instructions: Players will need to roll dice and advance to the specified space on the board. Every space they reach on the board can correspond to a card with a question they must answer to advance. For example, “The oil spill off the gulf coast in 2010 was a major environmental disaster, but an economic one as well, why?”
 - Tip: create 5 categories and make these the game spaces, mix it up by including “lose a turn” and “roll again” spaces. One example category could be “opportunity costs” and an example question is, “What are the possible opportunity costs of going to the movies on a Saturday night?”

Resources:

- americasheartland.org
- pbs.org/newshour/extra/teachers/economics
- pbsteachers.org
- economist.com/research/Economics
- federalreserveeducation.org
- councilforeconed.org
- econedlink.org

Attachments

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Standards connected to “Risky Agriculture” lesson

National Standards (Council for Economic Education)¹

Standards directly addressed by lesson:

- Standard 1 : Scarcity
 - 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.
- Standard 2 : Marginal Cost/Benefit
 - Effective decision making requires comparing the additional costs of alternatives with the additional benefits. Most choices involve doing a little more or a little less of something: few choices are "all or nothing" decisions.
- Standard 8 : Role of Price in Market System
 - Prices send signals and provide incentives to buyers and sellers. When supply or demand changes, market prices adjust, affecting incentives.

Standards indirectly addressed by lesson (or directly by extensions to the lesson):

- Standard 7 : Markets - Price and Quantity Determination
 - Markets exist when buyers and sellers interact. This interaction determines market prices and thereby allocates scarce goods and services.
- Standard 13 : Role of Resources in Determining Income
 - Income for most people is determined by the market value of the productive resources they sell. What workers earn depends, primarily, on the market value of what they produce and how productive they are.
- Standard 17 : Using Cost/Benefit Analysis to Evaluate Government Programs
 - Costs of government policies sometimes exceed benefits. This may occur because of incentives facing voters, government officials, and government employees, because of actions by special interest groups that can impose costs on the general public, or because social goals other than economic efficiency are being pursued.
- Standard 18 : Macroeconomy-Income/Employment, Prices
 - A nation's overall levels of income, employment, and prices are determined by the interaction of spending and production decisions made by all households, firms, government agencies, and others in the economy.
- Standard 20 : Monetary and Fiscal Policy
 - Federal government budgetary policy and the Federal Reserve System's monetary policy influence the overall levels of employment, output, and prices.

¹ <http://www.councilforeconed.org/ea/standards/>

State of California²

- Grade Twelve: History and Social Sciences – Principles of Economics
 - 12.2.2 Discuss the effects of changes in supply and/or demand on the relative scarcity, price, and quantity of particular products
 - 12.2.4 Explain how prices reflect the relative scarcity of goods and services and perform the allocative function in a market economy
 - 12.2.6 Describe the effect of price controls on buyers and sellers
 - 12.3.3 Describe the aims of government fiscal policies and their influence on production, employment, and price levels
- Grades Eleven and Twelve: English Language Arts - Listening and Speaking
 - 1.0 Students formulate adroit judgments about oral communication. They deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning. They use gestures, tone, and vocabulary tailored to the audience and purpose.
 - 1.6 Use logical, ethical, and emotional appeals that enhance a specific tone and purpose
 - 1.7 Use appropriate rehearsal strategies to pay attention to performance details, achieve command of the text, and create skillful artistic staging
 - 1.8 use effective and interesting language, including:
 - Informal expressions for effect
 - Standard American English for clarity
 - Technical language for specificity
 - 1.9 Use research and analysis to justify strategies for gestures, movement, and vocalization, including dialect, pronunciation, and enunciation

21st Century Skills³

- Grade 12- Social Sciences
 - Utilizing TV, Video, and DVD to exercise sound reasoning, make complex choices, understand the interconnections among systems, and frame, analyze, and solve problems.

² <http://www.cde.ca.gov/be/st/ss/>

³ http://www.p21.org/index.php?Itemid=33&id=31&option=com_content&task=view

Glossary of Terms:

- **Competitive Advantage:** something that gives a firm (or a person or country) an edge over its rivals (*The Economist*)⁴
- **Consumer Prices:** the prices paid by whoever finally consumes goods or services, as opposed to prices paid by firms at various stages of the production process (*The Economist*)
- **Cost of Production:** amount paid for resources (land, labor, capital and entrepreneurship) used to produce goods and services (Econ EdLink)⁵
- **Cost/Benefit Analysis:** A method of reaching economic decisions by comparing the costs of doing something with its benefits. It sounds simple and common-sensical, but, in practice, it can easily become complicated and is much abused. With careful selection of the assumptions used in cost-benefit analysis it can be made to support, or oppose, almost anything. This is particularly so when the decision being contemplated involves some cost or benefit, for which there is no market price or which, because of an **externality**, is not fully reflected in the market price. Typical examples would be a project to build a hydroelectric dam in an area of outstanding natural beauty or a law to require factories to limit emissions of gases that may cause ill-health. (*The Economist*)
- **Demand:** One of the twin driving forces of the market economy. Demand is not just about measuring what people want; for economists, it refers to the amount of a good or service that people are both *willing and able* to buy. The demand curve measures the relationship between the price of a good and the amount of it demanded. Usually, as the price rises, fewer people are willing and able to buy it; in other words, demand falls (there are exceptions, e.g. inferior goods, but we will not discuss those in this activity). When demand changes, economists explain this in one of two ways. A movement along the demand curve occurs when a price change alters the quantity demanded; but if the price were to go back to where it was before, so would the amount demanded. A shift in the demand curve occurs when the amount demanded would be different from what it was previously at any chosen price, for example, if there is no change in the market price, but demand rises or falls. (*The Economist*)
- **Externality:** An economic side-effect. Externalities are costs or benefits arising from an economic activity that affect somebody other than the people engaged in the economic activity and are not reflected fully in prices. For instance, smoke pumped out by a factory may impose clean-up costs on nearby residents; bees kept to produce honey may pollinate plants belonging to a nearby farmer, thus boosting his crop. Because these costs and benefits do not form part of the calculations of the people deciding whether to go ahead with the economic activity they are

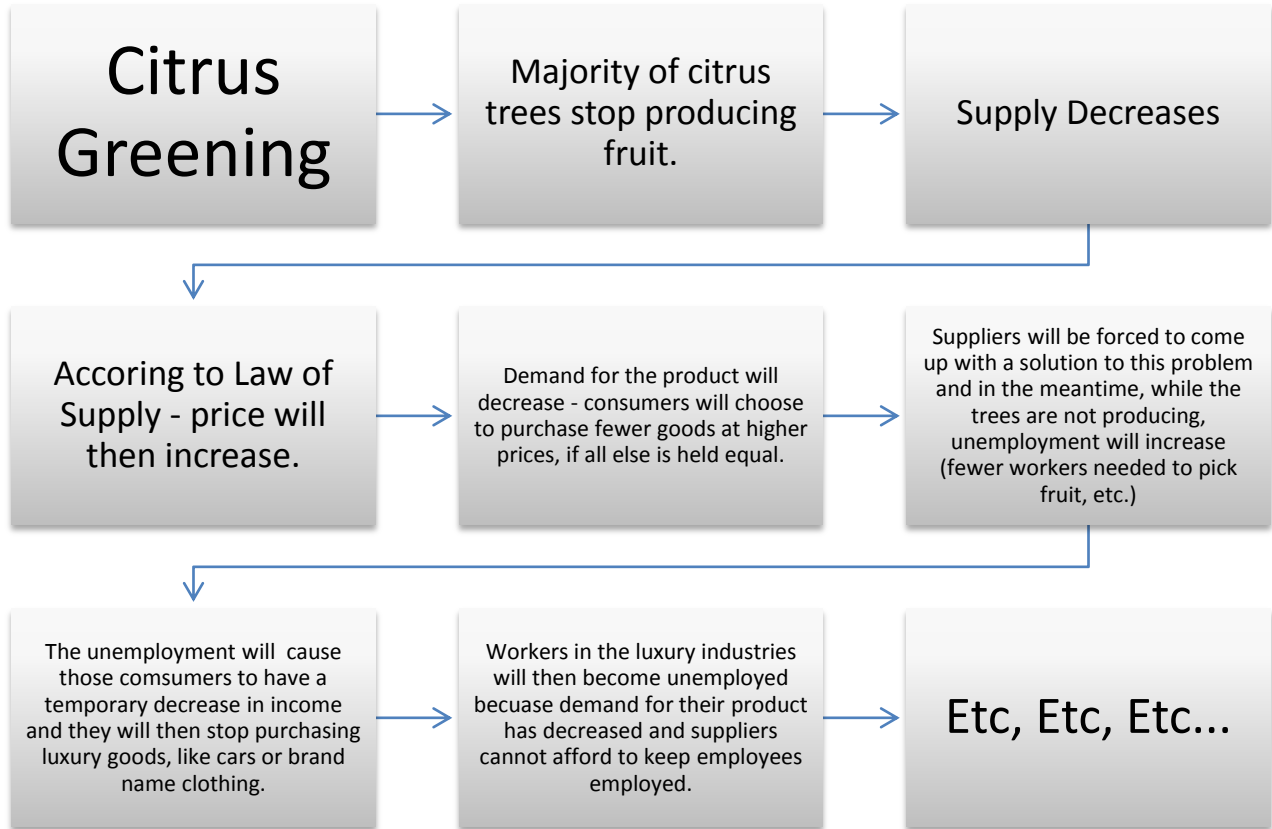
⁴ <http://www.economist.com/research/Economics/>

⁵ <http://www.councilforeconed.org/>

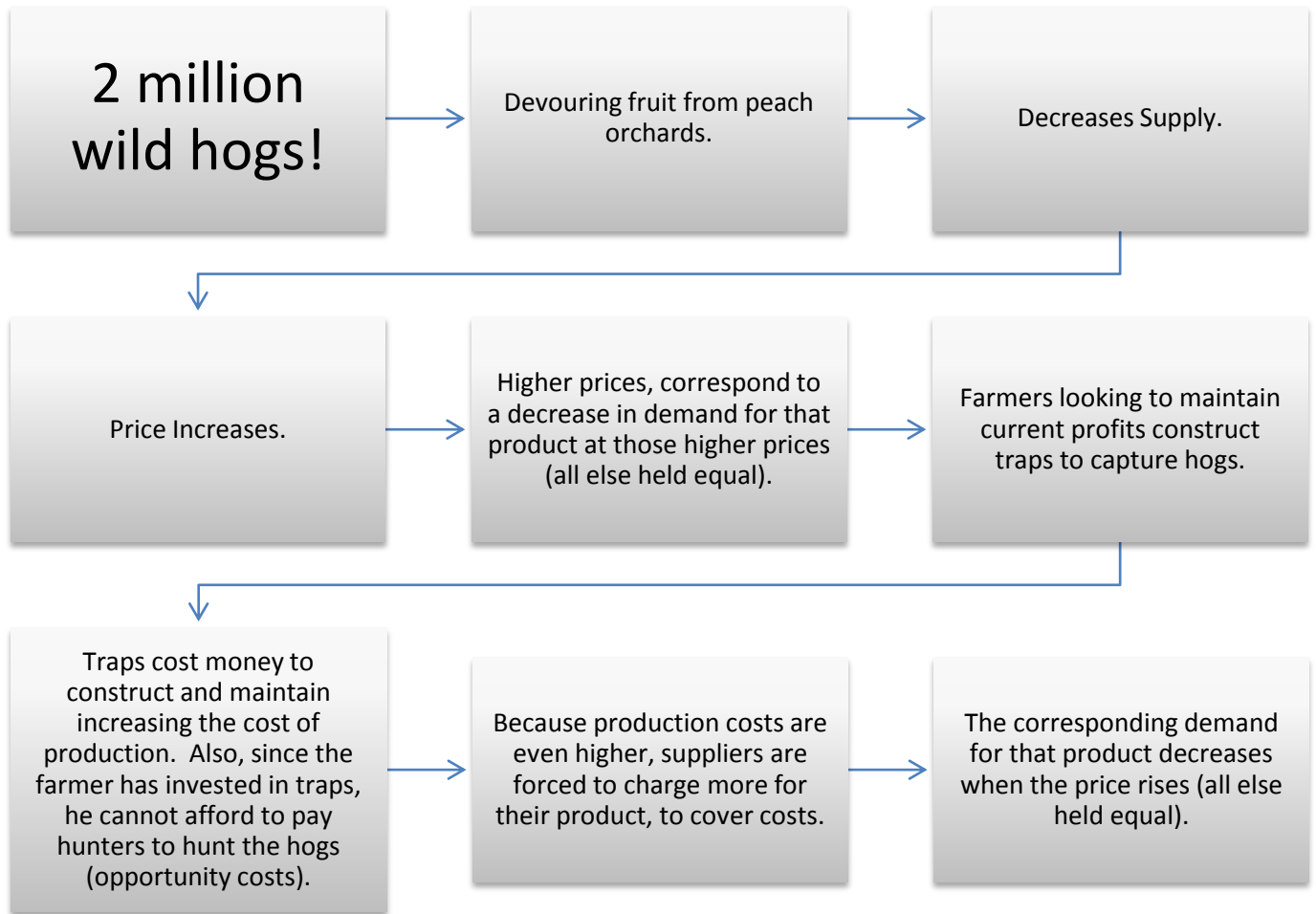
a form of market failure since the amount of the activity carried out if left to the free market will be an inefficient use of resources. If the externality is beneficial, the market will provide too little; if it is a cost, the market will supply too much. One potential solution is regulation: a ban, say. Another, when the externality is negative, is a tax on the activity or, if the externality is positive, a subsidy. But the most efficient solution to externalities is to require them to be included in the cost of those engaged in the economic activity, so there is self-regulation. For instance, the externality of pollution can be solved by creating property rights over clean air, entitling their owner to a fee if they are infringed by a factory pumping out smoke. (*The Economist*)

- **Fiscal Policy:** Changes in the expenditures or tax revenues of the federal government, undertaken to promote full employment, price stability and reasonable rates of economic growth. (Econ EdLink)
- **Market Economy:** An economy that relies on a system of interdependent market prices to allocate goods, services, and productive resources and to coordinate the diverse plans of consumers and producers, all of them pursuing their own self-interest. (Econ EdLink)
- **Opportunity Costs:** The true cost of something is what you give up to get it. This includes not only the money spent in buying (or doing) the something, but also the economic benefits that you did without because you bought that particular something and thus can no longer buy (or do) something else. (*The Economist*)
- **Price:** The amount of money that people pay when they buy a good or service; the amount they receive when they sell a good or service (Econ EdLink)
- **Producers:** People and firms that use resources to make goods and services (Econ EdLink)
- **Profit:** Income received for entrepreneurial skills and risk taking, calculated by subtracting all of a firm's explicit and implicit costs from its total revenues (Econ EdLink)
- **Supply:** The amount of a good or service available at any particular price. The law of supply is that, other things remaining the same, the quantity supplied will increase as the price increases. The actual amount supplied will be determined, ultimately, by what the market price is, which depends on the amount demanded as well as what suppliers are willing to produce. (*The Economist*)
- **Unemployment:** The number of people without jobs who are actively seeking work (Econ EdLink)

This flow chart is one *possible* example of the economic consequences of Citrus Greening. Your class may fill in a flow chart with a completely different set of consequences - just be sure to keep in mind, at minimum, supply and demand. Other concepts will be explored later in the lesson.



This flow chart is one *possible* example of the economic consequences of wild hogs. Your class may fill in a flow chart with a completely different set of consequences. This is great, just be sure that they keep in mind, at minimum, supply, demand, and opportunity costs.



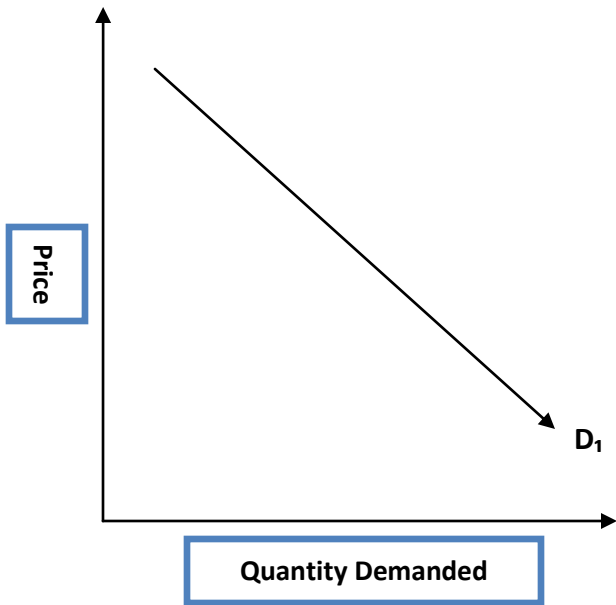
Rubric for Debate⁶

| | Excellent | Good | Fair | Needs Improvement |
|---------------------------|--|--|---|--|
| Content | Student uses four or more economic terms in his/her argument; the economic terms used are relevant to the topic | Student uses three economic terms in his/her argument; the economic terms used are relevant to the topic | Student uses two economic terms in his/her argument; the economic terms used are semi-relevant to the topic | Student uses no more than one economic term in his/her argument; the economic term used is not relevant to the topic |
| Organization | Student organizes his/her argument clearly and concisely and stays within the time allotted; the argument is extremely logical and thorough | Student organizes his/her argument clearly and concisely and stays within the time allotted; the argument is logical but could be explored in more detail | Student has some organization to his/her argument and struggles to stay within time allotted; the argument is sometimes logical | Student attempts to organize his/her thoughts, but does not succeed; student does not stay within time allotted; the argument is confusing and illogical |
| Style and Delivery | Student uses gestures, tone, and vocabulary tailored to the audience and with the purpose of winning the debate; student clearly enunciates and pronounces words correctly | Student uses a tone that is clearly aimed at winning the debate and uses some gestures and appropriate vocabulary ; student enunciates and pronounces most words correctly | Student attempts to use gestures, tone, and vocabulary tailored to the debate, but struggles; student struggles to enunciate (may speak too softly or mumble) and pronounce words correctly | Student does not use appropriate tone, gestures, or vocabulary; student does not enunciate words and often cannot be heard by his/her audience |

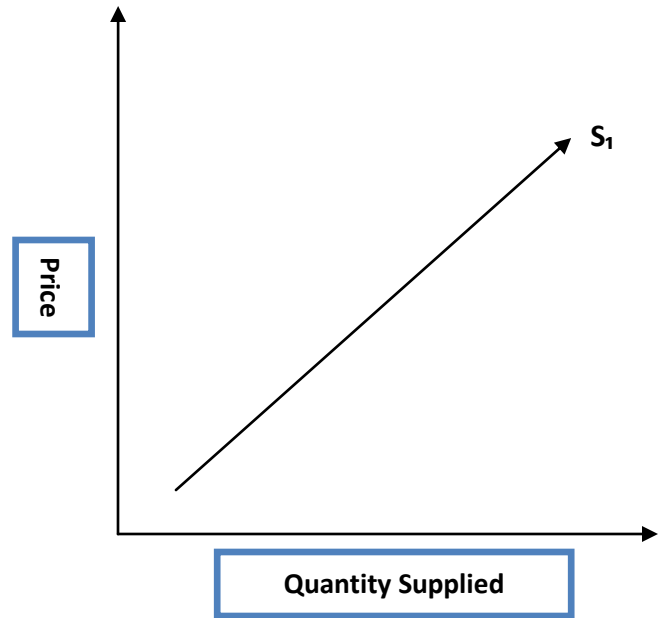
⁶ Aligned to English Language Arts California Content Standards for Grades Eleven and Twelve; <http://www.cde.ca.gov/be/st/ss/documents/elacontentstnds.pdf>



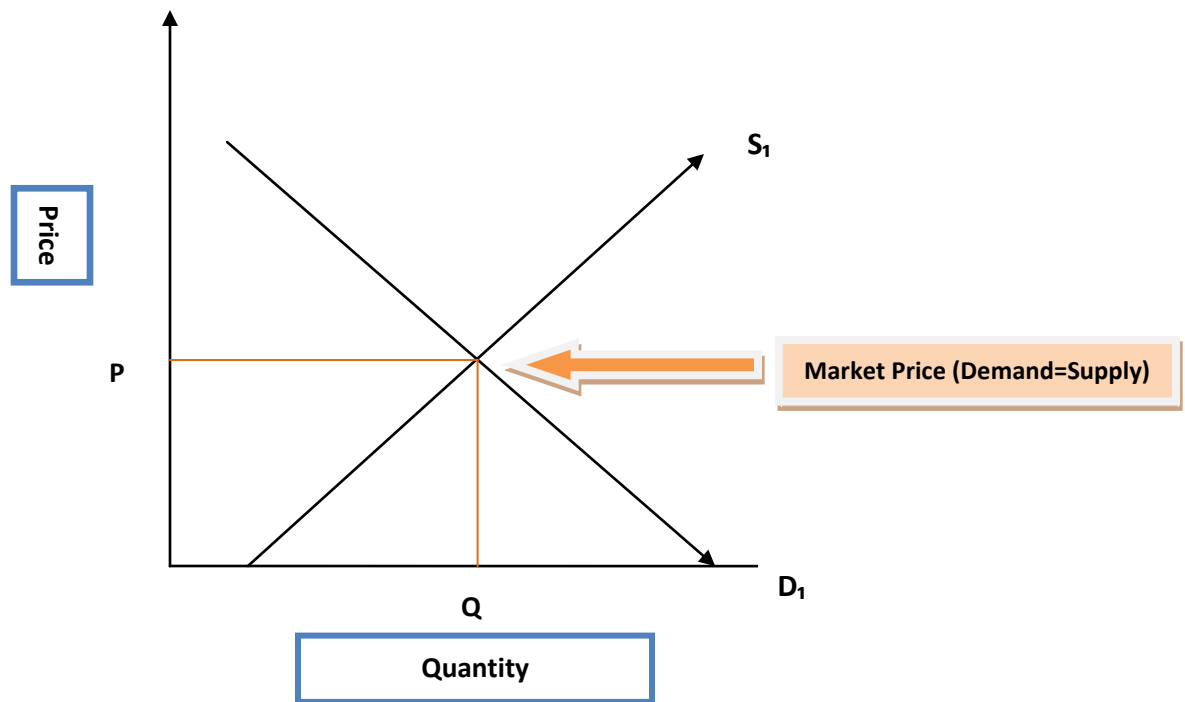
Law of Demand



Law of Supply



Market Equilibrium: Supply = Demand



Source: <http://www.councilforeconed.org/>

America's Heartland – Episode 504 – Viewing Guides

“Citrus Concerns”

1. The _____ citrus growing industry is a multi - _____ dollar industry.

2. Citrus Greening is affecting supply or demand? Why?

3. Other threats to the industry include _____, _____, and

_____.

4. What is a ripple effect?

5. Spraying _____ has environmental and economic limitations.

6. What is meant by stop gap?

“Hog Hunt”

1. What are feral hogs? _____
2. In Texas, there are between ___ and ___ million wild hogs.
3. Feral hogs cause divots in the ground which will prevent farmers from being able to do what?

4. The total estimated economic damage is \$___ million per year.
5. Name three ways that hogs affect supply in the Texas agriculture industry.
 1. _____
 2. _____
 3. _____
6. Capturing large hogs in traps can reduce populations by ____%.

***America's Heartland* – Episode 504 – Viewing Guide Answer Key**

“Citrus Concerns”

1. The Florida citrus growing industry is a multi – billion dollar industry.

2. Citrus Greening is affecting supply or demand? Why?

Supply. People still want to purchase oranges, but the disease is affecting the number of oranges available for purchase. In the long run, it may affect demand (when prices rise, consumers' quantity demanded decreases).

3. Other threats to the industry include hurricanes, freeze, and citrus canker.

4. What is a ripple effect?

A ripple effect refers to the economic consequences that will result from citrus greening. With each effect, this will spark a new effect, and so on. For example, the disease impacts the citrus, this impacts supply, and this impacts unemployment rates, etc.

5. Spraying pesticides has environmental and economic limitations.

6. What is meant by stop gap?

It is a temporary solution that cannot keep working in the long term because of various negative impacts associated with the solution.

“Hog Hunt”

1. What are feral hogs?
Wild pigs
2. In Texas, there are between 1 and 2 million wild hogs.
3. Feral hogs cause divots in the ground which will prevent farmers from being able to do what?
Use tractors in the fields preventing them from being able to reap economic benefits from their work.
4. The total estimated economic damage is \$52 million per year.
5. Name three ways that hogs affect supply in the Texas agriculture industry.
 1. Tearing up pastures
 2. Rooting up orchards
 3. Breaking up underground irrigation lines
 4. Killing small livestock
6. Capturing large hogs in traps can reduce populations by 70%.

Debate Cards

| | |
|--------|------|
| Citrus | Hogs |
| Citrus | Hogs |
| Citrus | Hogs |
| Citrus | Hogs |
| Citrus | Hogs |

Citrus

| | |
|-----------------------------|-----------------------------|
| Pesticides (Pro) | Pesticides (Con) |
| Biological Control (Pro) | Biological Control (Con) |
| Doing Nothing (Pro) | Doing Nothing (Con) |
| Starting Over (Pro) | Starting Over (Con) |
| Other Alternative (Pro) | Other Alternative (Con) |

Hogs

| | |
|---------------------------------|---------------------------------|
| Hunting (Pro) | Hunting (Con) |
| Traps (Pro) | Traps (Con) |
| Moving Out of State (Pro) | Moving Out of State (Con) |
| Doing Nothing (Pro) | Doing Nothing (Con) |
| Other Alternative (Pro) | Other Alternative (Con) |