

Renewable Fuels



Renewable Fuels Foundation



Renewable Fuels Association



Agriculture and the Ethanol Industry

Unit 1 Lesson 2

Precepts

- B. Relationships
 - B2. Interact and work with others.
- E. Awareness
 - E1. Address issues important to the community.

National Standards

NL-ENG.K-12.6. Applying knowledge.

Student Learning Objectives

- As a result of this lesson, the student will ...
1. Identify the impact ethanol has on agricultural commodities.
 2. Identify the impact ethanol has on agricultural communities.
 3. Identify the impact ethanol has on the U.S. and world agricultural industry.

Time

Instruction time for this lesson: 50 minutes.

Resources

<http://www.ethanol.org>
www.ethanolrfa.org
<http://www.ncga.com/ethanol/main/index.asp>
<http://www.nwicc.cc.ia.us/pages/continuing/business/ethanol/Module3.htm>
http://www.drivingethanol.org/news_events/media_video.aspx
www.youtube.com

Tools, Equipment, Supplies

Writing surface
Transparencies and projector
Screen
Internet access
Copies of article from interest approach for each student
AS.A - one per student
AS.B - one per student
TM.A
Assess.A
Large index cards for objective 2

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3 x 5" index cards for review

Scissors

8 ½ x 11" paper or larger

Markers

Tape or other means to affix index cards to wall/writing surface

Key Terms

The following terms are presented in this lesson and appear in ***bold italics***:

Agricultural

Commodities

Communities

Ethanol

INTEREST APPROACH

*Locate a local and recent article in your area about how **ethanol** has impacted a local community or the commodity prices in your area and have students read through the article. Discuss the content of the article and then continue on with the content of the lesson.*



Let's take a look at this article on **ethanol** and the **agricultural** industry. As we read it, think about the connections between the **ethanol** industry and agriculture. Who can read the first paragraph (5 sentences, etc.) for us?

Continue having individuals read until the article is read.



Great job reading! What have we learned about the **ethanol** industry from this article? *Elicit student responses and discuss.*



According to this article, how has **ethanol** impacted our community? *Elicit responses.* These impacts we identified lead us into our topic for today. We are going to look more in depth at the impact the **ethanol** industry has on agriculture.

OBJECTIVE 1. Identify the impact ethanol has on agricultural commodities.

To guide students through the process of identifying the impact ethanol has on agricultural commodities, students will engage in the Meteorologist Moment. Transition students from the interest approach to the objective by having them identify more connections between agriculture and the ethanol industry.



We've read about the impacts that **ethanol** has on our community. In a moment, we will think about the connections between agriculture and the **ethanol** industry. When I say "Brainstorm" take out a piece of paper and a writing utensil. Take two minutes to consider all the aspects of the agricultural industry and make as many connections related to **ethanol**. Record the connections and be prepared to share your connections with the class. What questions are there? Okay, "Brainstorm!"

Let students know when 1 minute is remaining, 30 seconds, 15 seconds. When two minutes are up, have students share the connections they recorded.



Let's see what connections we have discovered. Who can tell us one of the connections you made between agriculture and **ethanol**?

Elicit student responses.



These are great connections. Some of the connections, like the connection between corn and **ethanol** are well known and visible. However, there are other connections between **ethanol** and agriculture that are not as easy to see. Let's take a look at some of these connections in depth.

Pass out AS.A to students.



Let's take a look at the information on AS.A. We are going to read through the items on the handout as a class. As we do, we will identify key information by underlining, circling, or highlighting the key terms. Be sure to follow along as we read aloud. Take out a writing utensil so you can underline, circle, or highlight the key information as we discover it.

Who can read for us the information in item A? *Allow a student to read the content for line A from AS.A.*



Great job reading! Take a moment to underline, circle or highlight the key information.

Repeat for items B-E. Allow a different student to read each item. Provide students time to identify the key information for each item. Continue by showing the video clip.

I. **Ethanol** provides a vital value-added market for corn and other **commodities**, providing an economic boost to rural America.

A. Demand created by **ethanol** production increases the price a farmer receives for grain.

B. An increasing number of farmers are joining together in cooperatives to build **ethanol** production facilities - thereby directly taking advantage of the value-added market through ownership.

C. In 2006, 2.3 billion bushels of corn were used for **ethanol** production, representing 18 percent of total U.S. corn production. **Ethanol** is the third largest component of corn demand in the U.S. behind food production and exports. In 2007, farmers planted more than 90 million acres of corn. This was the largest crop in over 60 years with the least amount of land ever in production. U.S. farmers will meet the challenge of a diversified market: Food, exports and energy.

D. **Ethanol** accounts for 14 cents of the value of every bushel of corn marketed by American farmers. Price response will vary according to crop prospects, carryover levels and global supply and demand.

E. Each 100 million bushels of corn used in increased **ethanol** production affects the price of other **commodities** adding two cents per bushel to the wheat price and 10 to 13 cents to the price of soybeans.

Bob the Weather Guy Moment

This Moment helps students break down and summarize the information by creating a short “weather report”. Students must determine the key aspects of the information, organize it and present it in a meaningful fashion. Present the students with the content in AS.1 and have students in the class read the information aloud. Allow students the opportunity to determine the most important information from the content presented. Then, show students a taped weather report or find a video clip of a weather report from a website like www.youtube.com. After watching the weather clip, lead a short brainstorming session eliciting the terminology of a weather report. Direct students to write a 30 second – 1 minute weather report. Allow 10-15 minutes at a minimum for groups to prepare and rehearse. Then, groups will present their “weather reports” to the class.



Many of us have seen weather reports on television or heard weather reports on the radio. Weather people have a short amount of time to convey a lot of important information to viewers and listeners. Today, we are going to take on the role of a weatherperson. Let’s take a look at a video clip of a weather forecast. As we watch the video clip, listen to the weather terms you hear the weatherperson say and record them on the back of the handout. What questions are there before we watch the video clip? Okay, let’s see what terms a weatherperson uses.

Show weather video clip. After weather clip is over, generate a list on the writing surface of the weather terms students came up with.



Let’s see what terms we came up with. In a moment we’ll share the terms we recorded. As I record terms on the writing surface, check over your list of terms and add to it. Who can share with us the terms you came up with? *Elicit student responses to generate a list of terms.*

Now that we have a good list of weather terms, let’s think about how the important information we identified earlier could be put into a weather report. Think about how we can take the key

terms from the handout and combine them with the weather terms we have identified. In a moment we will split into groups to develop a weather report that combines the key information with the weather terms. Then, we will share our weather reports with the rest of the class. What questions are there?

Split students into groups in groups of 2-3. Ideas for grouping include: pre-existing work groups, alphabetically by first or last name, count off, or cluster students who sit near each other.



Let's split up into groups of 2-3.

Now that we are in groups, let's be sure that we understand our task. Who can remind us what we need to do to create our weather reports? *Elicit student response, clarify any misunderstood instructions.*



Awesome, we are almost ready to start reporting. When I say "Report it" we will take about 15 minutes to create and rehearse our weather reports. When your group has created a report, choose one person who will present the weather report to the class. What questions are there before we get started? Okay, "Report it!"

Circulate the room to assist students in putting together weather reports. Additionally, the instructor should monitor time to adjust for allowing more or less time as necessary. When students are finished, have each group present their weather report to the class.



As I was walking through the room, I saw some awesome weather reports developing! Let's show what we have created. Raise your hand if you are presenting your group's weather report. Awesome! In a moment, we will hear each group's weather report. As you listen to each report, listen to the connections made between the **ethanol** content and the weather terms. Think about the relationships between the items on your handout. Let's have our first group present!

Allow time for each group to present. Show appreciation through applause or other means after each person presents. When finished, summarize the objective by reminding students of the key points from the content they identified earlier.



Great job presenting weather reports! Take a moment to look at AS.A and review the important elements you underlined, circled, or highlighted earlier. *Pause and allow time for students to look through handout.*



What questions are there? Through our weather reports we have identified the impact **ethanol** has on **agricultural commodities**.

OBJECTIVE 2. Identify the impact ethanol has on agricultural communities.

*Recall with students the article from the beginning of the lesson. Ask students to think back to the impact(s) **ethanol** had on the local community. Explain that there are other factors of **ethanol** that affect the **agricultural** community as a whole. Use a Go-Get-It Moment combined with guided notes on AS.B to present content to students. Prior to class, instructor will need to transfer the words and phrases from TM.A to index cards, placing the pieces around the room.*



Think back to the article we read at the beginning of the lesson. What were the impacts the **ethanol** industry had on our local area? *Elicit responses. Validate or expand on responses based on the content of the article.*



The factors we identified are part of the impact the **ethanol** industry has on our local **community**. Let's see how **ethanol** impacts the **agricultural community** as a whole. Our task now is to consider these impacts.

Pass out AS.B

Go-Get-It Moment



As you can see, we are missing some critical information from this handout. These critical pieces are recorded on cards placed around the room. When I say "Go-Get-It", stand up and search the room for the missing pieces. When you have found an item, return to your seat. What questions are there? "Go get it!"

Have students tape/affix cards to wall or writing surface at front of room. Then guide students in discussion to determine where each piece fits.



We know these items fit in the blanks, but we don't know where. Let's tape the cards to the wall at the front of the room. If you have a card, bring it forward and tape it to the wall.

Let's think about where each item fits. As we identify where the pieces fit, fill in the appropriate words or phrases in each blank. Looking at the first blank space on our sheet, what might fit there?

Continue to fill in each blank using the remaining cards. The instructor should use the content in objective 2 as a guide.

II. The production and use of **ethanol** benefits our economy on all levels - local, state and national.

A. The local **communities** where the crops are grown and processed to the metropolitan areas where drivers fill up with a domestically produced fuel, American-made **ethanol** propels the economy.

B. In a 2002 recent study, the Farm Credit System (FCS), a nationwide network of borrower-owned financial institutions, has provided much of the debt financing to the rapidly growing **ethanol** industry. FCS financed **ethanol** projects on rural, state and national economies:

1. The construction of 3.9 billion gallons of **ethanol** capacity added \$23.3 billion of gross output to the economy during the construction period.
2. This activity generated \$5.5 billion in household income and supported 136,345 jobs in all sectors of the economy.
3. The combination of spending for annual plant operation and **ethanol** transportation adds \$13.7 billion to the U.S. gross domestic product.
4. The increased economic activity supports 99,188 jobs in all sectors of the economy. Included are more than 15,000 jobs in America's manufacturing sector.
5. The full impact of the annual operations of these **ethanol** plants generates about \$1.6 billion of tax revenue for the federal government and nearly \$1.3 billion of tax revenue for state and local governments.



We did an awesome job of considering each set of missing words and phrases to determine the missing content. We have all of the pieces to identify the impact **ethanol** has on **agricultural communities**. Now it's time to test our knowledge with Jeopardy!

REVIEW/SUMMARY

Use the student learning objectives to summarize the lesson. The Jeopardy Moment is an excellent activity for reviewing material with students. Student's responses can then be used to determine which objectives need to be reexamined and which objectives were successfully understood.

Jeopardy Moment

Prior to class the instructor should determine categories for questions. Suggestions include Dollars; Jobs; Crops/Grain; People & Groups. Using these, or other categories determined by the instructor, have students write facts from the lesson on 3x5 cards. On a separate sheet of paper, have students write an appropriate question for each fact card created. Question writing primes students for the game. The instructor should then gather the fact cards by category and remove duplicates. Review the procedure for playing "Jeopardy" and make any modifications needed for your classroom. Finally, before playing, group students into teams. All questions (answers) are of equal value.



Who has watched the television show "Jeopardy"? What happens on the show? *Elicit student responses.*



Right, the host gives contestants the answer to a question. To respond, contestants have to create a question for that answer. Today, we will play "Jeopardy" to review what we have learned about the **ethanol** industry and agriculture. To start, we need to create fact cards using the content we learned from objectives 1 and 2. As you create fact cards, also think about a question that could go along with that fact. Record the questions on a separate piece of paper.

Pass out 3x5 cards.



What questions are there about creating fact cards? Okay, let's come up with some great facts to use in Jeopardy!

Instructor should assist students in creating fact cards. Once students are finished creating fact cards, collect by category and review the procedure for playing Jeopardy.



Now that we have our facts, we can review the content by playing Jeopardy. I will serve as the host and we will work in teams. All answers will be of equal value. Teams will gain control of the board by providing a correct question to an answer. Teams will ring in by having one person in the group raise their hand. Each person in the group must take a turn before another person can go a second time. Remember, you will respond with a question to each fact I give you. What questions are there? It's time for Jeopardy!

As students provide answers to questions, take time to clear up any misunderstandings about the content. The instructor can keep score or groups can keep score. The instructor may wish

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to award a prize for the team with the most points at the end. The instructor can make the game more entertaining by taking on characteristics of the host. To determine which group goes first, have groups guess a number, flip a coin, or determine through “rock, paper, scissors”.



We did a great job showing our knowledge about the ***ethanol*** industry and agriculture by creating questions to answer Jeopardy facts. What questions are there about the content we have learned today? Let’s see what we remember by taking a short evaluation for this lesson.

APPLICATION

Extended classroom activity: *Students are to identify the current commodity price for corn, (Can be found through any source) and monitor the change over a seven day period. Students should also research and identify commodity prices for the same week one year prior. Based on their findings, students should be prepared to make an assertion as to the effect of **ethanol** production on the price of corn in the current marketplace.*

FFA activity: *Students can create a marketing plan for a local **agricultural** business associated with the **ethanol** industry. In teams, students can use this information to participate in the local Marketing Plan Career Development Event.*

SAE activity: *Students can prepare a poster presentation of the direct and in-direct connections and impacts between their SAE project(s) and the **ethanol** industry. Posters can be shared with the class and displayed throughout the community.*

EVALUATION

Assess.A

Answers to Evaluation:

True or False

1. True
2. False
3. False
4. True
5. True

TM.A

Note to instructor: Write the words/phrases from this sheet on index cards. Write the words large enough to be seen throughout the room.

Local**State****National****Communities****Fuel****Economy****2002****Farm Credit System (FCS)****3.9 billion gallons****\$23.3 billion****Household income****136,345 jobs****Annual plant operation****Tax revenue****America's manufacturing sector****State and local governments**

AS.A

I. **Ethanol** provides a vital value-added market for corn and other **commodities**, providing an economic boost to rural America.

A. Demand created by **ethanol** production increases the price a farmer receives for grain.

B. An increasing number of farmers are joining together in cooperatives to build **ethanol** production facilities - thereby directly taking advantage of the value-added market through ownership.

C. In 2006, 2.3 billion bushels of corn were used for **ethanol** production, representing 18 percent of total U.S. corn production. **Ethanol** is the third largest component of corn demand in the U.S. behind food production and exports. In 2007, farmers planted more than 90 million corn acres. This was the largest crop in over 60 years with the least amount of land ever in production. U.S. farmers will meet the challenge of a diversified market: food, exports and energy.

D. **Ethanol** accounts for 14 cents of the value of every bushel of corn marketed by American farmers. Price response will vary according to crop prospects, carryover levels and global supply and demand.

E. Each 100 million bushels of corn used in increased **ethanol** production affects the price of other **commodities** adding two cents per bushel to the wheat price and 10 to 13 cents to the price of soybeans.

AS.B

II. The production and use of **ethanol** benefits our economy on all levels - _____, _____ and _____.

A. The local _____ where the crops are grown and processed to the metropolitan areas where drivers fill up with a domestically produced _____, American-made **ethanol** propels the _____.

B. In a _____ recent study, the _____, a nationwide network of borrower-owned financial institutions, has provided much of the debt financing to the rapidly growing **ethanol** industry. FCS financed **ethanol** projects on rural, state and national economies:

1. The construction of _____ of **ethanol** capacity added _____ of gross output to the economy during the construction period.
2. This activity generated \$5.5 billion in _____ and supported _____ in all sectors of the economy.
3. The combination of spending for _____ and **ethanol** transportation adds \$13.7 billion to the U.S. gross domestic product.
4. The increased economic activity supports 99,188 jobs in all sectors of the economy. Included are more than 15,000 jobs in _____.
5. The full impact of the annual operations of these **ethanol** plants generates about \$1.6 billion of _____ for the federal government and nearly \$1.3 billion of tax revenue for _____.

Assess.A

True or False. Determine for each statement if it is true or the statement is false as written.

- _____ 1. Demand created by **ethanol** production increases the price a farmer receives for grain.
- _____ 2. Each million bushels of corn used in increased **ethanol** production effects the price of other **commodities** adding two cents per bushel to the wheat price.
- _____ 3. A decreasing number of farmers are joining together in cooperatives to build **ethanol** production facilities.
- _____ 4. **Ethanol** provides an economic boost for rural America
- _____ 5. **Ethanol** increased the number of manufacturing jobs in rural America by 15,000.