Lesson 4-REVIEW: BIOFUELS IMPACT ON ENVIRONMENT, ECONOMY, AND ENERGY INDEPENDENCE

STATE STANDARDS

High School Composition

CMP.1.1 Engage in conversations with peers and teacher(s) to plan writing and evaluate how well writing achieves its purposes, and to explain personal reaction to the task. [11.4.1/12.4.1]

CMP.1.2 Demonstrate an understanding of the elements of discourse, such as purpose, speaker, audience, and form, when completing narrative, expository, persuasive, or descriptive writing assignments. [11.4.2/12.4.2]

CMP.1.3 Use point of view, characterization, style, and related elements for specific narrative (communication) and aesthetic (artistic) purposes. [11.4.3/12.4.3]

CMP.1.4 Structure ideas and arguments in a sustained and persuasive way and support them with evidence from texts or precise and relevant examples. [11.4.4/12.4.4]

CMP.1.13 Develop presentations using clear research questions and creative and critical research strategies, such as conducting field studies, interviews, and experiments; researching oral histories; and using Internet sources. [11.4.7/12.4.7]

CMP.2.3 Write academic essays, such as analytical essay, a persuasive essay, a research report, a summary, an explanation, a description, or a literary analysis that: [11.5.9/12.5.9] develops a thesis creating an organizing structure appropriate to purpose, audience, and context. Includes accurate information from primary and secondary sources and excludes extraneous information, makes valid inferences. Supports judgments with relevant and substantial evidence and well-chosen details; uses technical terms and notations correctly; provides a coherent conclusion.

CMP.3 Students write using Standard English conventions.

High School Speech and Communication

SPC.1.19 Deliver multimedia presentations that: [11.7.19/12.7.19] combine text, images, and sound by incorporating information from a wide range of media, including films, newspapers, magazines, CD-ROMs, online information, television, videos, and electronic media-generated images. Select an appropriate medium for each element of the presentation, use the selected media skillfully, editing appropriately and monitoring for quality. Test the audience's responses and revise the presentation accordingly.

Environmental Science, Advanced

ENV 1.16 Cite examples of how all fuels have advantages and disadvantages that society must question when considering the trade-offs among them, such as how energy use contributes to the rising standard of living in the industrially developing nations. However, explain that this energy use also leads to more rapid depletion of Earth's energy resources and to environmental risks associated with the use of fossil and nuclear fuels.

ENV.1.17 Describe how decisions to slow the depletion of energy sources through efficient technology can be made at many levels, from personal to national, and they always involve trade-offs of economic costs and social value.

ENV 1.20 Demonstrate how resources, such as food supply, influence populations.

ENV.1.21 Differentiate between renewable and non-renewable resources, compare and contrast the pros and cons of using non-renewable resources. Demonstrate knowledge of the distribution of natural resources in the U.S. and the world, and explain how natural resources influence relationships among nations.

ENV.1.23 Recognize and describe the role of natural resources in providing the raw materials for an industrial society.

ENV 1.24 Give examples of the various forms and uses of fossil fuels and nuclear energy in our society.

ENV.1.29 Recognize and describe important environmental legislation, such as the Clean Air and Water Act.

ENV.1.34 Differentiate between natural pollution and pollution caused by humans and give examples of each.

Biology

B.1.37 Explain that the amount of life any environment can support is limited by the available energy, water, oxygen, and minerals, and by the ability of ecosystems to recycle the residue of dead organic materials. Recognize, therefore, that human activities and technology can change the flow and reduce the fertility of the land.

B.1.42 Realize and explain that at times, the environmental conditions are such that plants and marine organisms grow faster than decomposers can recycle them back to the environment. Understand that layers of energy-rich organic material thus laid down have been gradually turned into great coal beds and oil pools by the pressure of the overlying earth. Further understand that by burning these fossil fuels, people are passing most of the stored energy back into the environment as heat and releasing large amounts of carbon dioxide.

World Geography

WG.5.6 Identify patterns of world resource distribution and utilization, and explain the consequences of the use of renewable and nonrenewable resources.

Social Studies

USH.2.2 Identify key ideas, movements and inventions and explain their impact on rural communities and urban communities in the United States.

USH.2.3 Identify the contributions of individuals and groups and explain developments associated with industrialization and immigration.

USH.5.6 Identify and describe the impact of World War II on American culture and economic life.

Economics - Social Studies

E.2.2 Identify factors that cause changes in market supply and demand. (Core Standard)

Global Economics

GE.1.1.2 Demonstrate the understanding of rational economic decision making by explaining the costs and benefits of alternative choices in a given situation.

GE.2.1.4 Evaluate the strengths and weaknesses of alternative economic systems.

Fundamentals of Agriculture Science and Business

FASB.A.1 Discuss agriculture and agribusiness and their role in the economy.

FASB.A.8 Compare and contrast the opportunities in agricultural production and non-traditional production and how it affects the economy.

FASB.A.9 Describe the role that agriculture plays in determining the overall economic situation of the American economy.

Student Learning Objectives

As a result of this lesson, the student will identify key factors regarding…

A. How biofuels impact the environment.
B. How biofuels benefit the economy.
C. The role biofuels play in energy independence.

Time

Instruction time for this lesson: 50 minutes.

Resource

www.indianabiofuels.com

Equipment and Supply List

Writing surface
Projector/Screen
Teacher and Student Materials from previous lessons
Assessment A – one per student

NOTE: Pages of this lesson plan may contain content from or ideas generated from National FFA's Renewable Fuels Instructional Materials and/or E-Moments. Pages are indicated with copyright notice(s).

LESSON PLAN CONTAINS SAMPLE DIALOGUE (NOTES AND INSTRUCTIONS ARE IN *ITALICS*):

CLASSROOM REVIEW

Have students utilize all their notes, worksheets and independent research for a lively discussion of each objective, spending about 10 minutes on each. Starting with the environment, ask students to share key points they found to be a strong influence on their thinking. What did they think before they learned this information? How did it affect their opinion about ethanol and/or biodiesel? Move through each of the three objectives, drawing students out and encouraging dialogue about the effect the lessons had on their feelings or previous opinions about biofuels, the environment, the economy, trade balance and national security. Guide students to an open conversation, not just a regurgitation of facts.

Alright, everyone take out your notes, worksheets, and research from the last four days. We will now review what we've learned on each of the following: biofuels impact on the environment, how biofuels benefit the economy, and the role biofuels play in energy independence. We'll start with biofuels impact on the environment. Who'd like to start

by sharing a key point from the lesson or additional research you gathered that had a large impact on your perception about biofuels affect on the environment. *Choose a student to share the first point.* Let's discuss the affect that this information had on our opinion of ethanol and/or biodiesel. *Ask student who shared the point if they'd like to go first.*

Continue asking questions to draw students out and keep the discussion flowing as you move through the objectives.

When the review is complete, have students complete and hand in the assessment test, then announce the Final Project.

Great job! We will now take a short test and then I will announce our final project. You have 10 minutes to complete the test and hand them in. *Pass out Assessment A.*

ANNOUNCEMENT

Announce final video project, specifications and entry requirements. Project is recommended as an outside classroom activity.

Video Project

Student(s) (one student or a team of up to three students) have the opportunity to create and develop their own video reflecting the benefits of Soy Biodiesel and/or Corn Ethanol, and how it affects the environment, economy, farmers, and foreign independence.

Specifications for Video Development:

- *Up to three minutes*
- *Format: DVD*
- *Must cover one of three topics:*

1. *How biofuels benefit the Environment*
2. *How biofuels benefit the Economy*
3. *How biofuels improve our Foreign Independence*

Entry Requirements

Each classroom will select their favorite video from those that the classroom has developed. The selected video will be submitted to Indiana Corn Marketing Council and Indiana Soybean Alliance as an entry for an opportunity to be selected as one of six finalists in a contest with the Indianapolis Colts.

Submissions will be judged based on the most complete knowledge of the benefits of biofuels, creativity, and effectiveness of communicating the message. Submissions must not infringe on any third-party proprietary rights, intellectual property rights,

industrial property rights, personal or moral rights or any other rights, including without limitation, copyright, trademark, patent, trade secret or confidentiality obligations, or otherwise violates applicable U.S. law.

The student or group of students submitting an entry, their parent(s) and teacher must read the Hoosier Horsepower Education Program Official Rules and complete the Student Application/Consent Release Form.

Prizes

Each participating classroom will have the opportunity to receive:

- *Hoosier Horsepower Posters featuring Dallas Clark – Indianapolis Colts Tight End*
- *Hoosier Horsepower Player Fan Cards containing statistics on Dallas Clark and information on Indiana Corn Marketing Council and Indiana Soybean Alliance*

TOP FIVE FINALISTS AND ONE GRAND PRIZE WINNER

Five students or teams will be awarded a $1,000 Scholarship; and one GRAND PRIZE winner (student or team) will receive a $1,500 Scholarship.

All finalists will be notified Mid-April, and will be awarded their Scholarships at a luncheon hosted at the Indiana Farm Bureau Football Center (date and time to be determined).

The GRAND PRIZE winner will be announced at the Indianapolis Colts first regular season home game at Lucas Oil Stadium (date and time to be determined). More detailed information will be provided specifically to the GRAND PRIZE winner at the time of notification that they have been selected as the Grand Prize winner. The GRAND PRIZE winning video will be displayed during the game.

All six of the selected winning videos will be posted on the Indiana Soybean Alliance, Indiana Corn Marketing Council and Indianapolis Colts web sites throughout the 2010 Hoosier Horsepower season. The Grand Prize Winning Video will be displayed through the 2010 Indianapolis Colts Make-It-Personal and Fan Fest events beginning in May 2010 and running through July 2010 (more details to come) on the Biofuels Mobile Learning Center video screen.

Alright class, now that we've filled our heads with biofuels knowledge it's time to share it. You will produce a video up to three minutes long on one or more of these three topics:

1. How biofuels benefit the Environment
2. How biofuels benefit the Economy
3. How biofuels improve our Foreign Independence

You can work individually or in groups of up to three. As you produce your videos, be mindful of copyright infringement* and be sure to cite sources for statistics. This will be an outside class project. You'll have two weeks from today to complete your video. At which time the class will judge the videos and select their favorite to be submitted to the Hoosier Horsepower program. Five finalists and one grand prize winner will be chosen from statewide submissions. Do you want to know what you could win?

**Note: If your class is not familiar with what constitutes copyright infringement, you may wish to have a discussion on the topic. A basic definition and a few examples pertaining to this project follow:*

Basic Definition:
Copyright is the exclusive right an artist, entertainer, musician, etc. has to reproduce, publish, perform, broadcast and sell their work. Anyone else wishing to do so must obtain permission of the copyright holder and often pay royalties. Not doing so can result in copyright infringement.

Examples:

1) *Music that is royalty free, public domain, or composed and performed by the student is fine. Using a track from the student's favorite album is not. Buying an album or paying to download music that is meant for personal listening does not come with the right to then broadcast that music to others in a video.*
2) *Photos, videos, and animations taken or created by the student, from public domain archives or royalty free stock sites† are fine. Just grabbing images, videos, and animations from internet sites, books, etc. without obtaining permission is not acceptable under copyright law.*

†sometimes small fees are involved to legally download the image or audio track, then it may be used without further permission or fees

Five students or teams will each be awarded a $1,000 Scholarship. The GRAND PRIZE winner or team will receive a $1,500 Scholarship. So, if you work as a team, keep in mind, you'll be splitting the prize between yourselves.

The GRAND PRIZE winner will be announced at the Indianapolis Colts first regular season home game at Lucas Oil Stadium (date and time to be determined). More detailed information will be provided specifically to the GRAND PRIZE winner at the time of notification that they have been selected as the GRAND PRIZE winner. The GRAND PRIZE winning video will be displayed during the game.

Additionally, the classroom of each of the six scholarship winners will receive an Autographed Colt Football.

Just for participating in this program our class will have the opportunity to receive:

- Hoosier Horsepower Posters featuring Dallas Clark – Indianapolis Colts Tight End
- Hoosier Horsepower Player Fan Cards containing statistics on Dallas Clark and information on Indiana Corn and Indiana Soybean organizations

So, what do you say we get creative and produce a winning video!

APPLICATION

Extended classroom activity: *Final Video Project to be developed as outside classroom activity.*

EVALUATION

Assessment A

Answers to Assessment:

Answers will vary. Refer to content from Lessons 1-3 and additional student research discussed during review.

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Assessment A

Essay:

1. Prior to these lessons, how did you feel about biofuels? If your opinion has changed, briefly state the catalyst for this change.

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2. Compared to petroleum-based fuels, do you think ethanol and biodiesel can make a difference in air quality and other environmental concerns? Provide support for your conclusion.

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3. If the biofuels industry suddenly ceased to exist, what impacts would that have on the U.S. economy and rural communities? What impact will there be if it continues to grow? Try to think of at least three possibilities for each.

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4. Name at least three key benefits to producing renewable, American-made energy sources.

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5. Of the three areas we've delved into – environment, economy and energy independence – which do you feel is most important to address and why?

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