



Unit 5: Energy

Lesson 2: Biodiesel- Teacher's Guide

Estimated Time for Completion – approximately 45

Student Learning Objectives:

- As a result of this lesson the student will...
 - Formulate a working definition of biodiesel.
 - Develop a deeper understanding of biodiesel production.
 - See firsthand how chemical energy is transformed into heat energy.

Purpose:

In recent decades, biofuels such as ethanol and biodiesel have boomed and provided a new spark in the life of renewable energy. In a state like Iowa that is located right in the heart of the grain belt, you cannot escape the conversations about biofuels. With all the talk and the increasing effect biofuels will have on our lives, it is important to know what we are dealing with. How does it work and how does biodiesel effect you?

Directions: Access the commodities and products tab on the AgMRC website (<http://www.agmrc.org>) and find the link to Biomass. Utilize information located here to answer the questions below:

1. According to the AgMRC website's biodiesel profile, what is biodiesel? List three sources of biodiesel.
 - First, select the Commodities and Products link.
 - Second, select the Energy link.
 - Third, select the Biodiesel link
 - Fourth, select the Biodiesel link at the end of the Overview section
 - Fifth, utilize information to answer question
2. Biodiesel has been commonly made through the process of transesterification. According to the AgMRC website, what products are made from this process and what are they used for?
 - First, select the Commodities and Products link.
 - Second, select the Energy link.
 - Third, select the Biodiesel link
 - Fourth, select the Biodiesel link at the end of the Overview section
 - Fifth, utilize information to answer question
3. Soybean oil, a feedstock, is currently the primary resource used in the production of biodiesel. What problems does the use of a feedstock create for the biodiesel industry?
 - First, select the Commodities and Products link.
 - Second, select the Energy link.
 - Third, select the Biodiesel link
 - Fourth, select the Biodiesel link at the end of the Overview section



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- Fifth, utilize information to answer question
4. The production of biodiesel in its simplest form has two main steps as identified by the AgMRC website. What are these steps and has there been any alternative methods of producing biodiesel? If so, what are the differences between the processes?
- First, select the Commodities and Products link.
 - Second, select the Energy link.
 - Third, select the Biodiesel link
 - Fourth, select the Biodiesel link at the end of the Overview section
 - Fifth, utilize information to answer question
5. Bq-9000 is a voluntary fuel quality assurance program. Why do you think it is important to have quality assurance programs oversee the production of biodiesel?
- First, select the Commodities and Products link.
 - Second, select the Energy link.
 - Third, select the Biodiesel link
 - Fourth, select the Biodiesel link at the end of the Overview section
 - Fifth, utilize information to answer question

Reinforcement Activity: Letter to the editor

You have just read a newspaper article written by an opponent of biodiesel. The article argued that using a feedstock to produce fuel instead of food was a poor use of our resources. Your assignment is to write a response to that article. Explain in your article why you support or disagree with the previous article and justify your response. Remember the audience of the newspaper is people that are likely not familiar with agriculture so you need to write in a way that makes your information clear and easy to understand.