

# Can used oil be the next generation fuel?

**A 10-11 grade science (chemistry) module on biodiesel**

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did you know ?

Biodiesel can be used in all cars which were manufactured since 1992 and later

did you know ?

At low temperatures biodiesel is viscous and can block filters

## Abstract

- Energy crisis is here. With the increase in world population, the demand for fuel and energy sources is increasing too. Most of the energy sources are derived from petroleum. These sources pollute the environment.
- One of the alternative energy sources is biodiesel, and it derives from plants.

## Activity 1 - world energy crisis

- We will have a class discussion about the world energy crisis, and examine some articles from the newspapers, in order to understand the causes and possible solutions.

## Activity 2 - comparison of fuels

**The students will:**

- Compare different fuels including biodiesel.
- Choose the best fuel from a list of possible sources.
- Propose an experiment in order to compare the efficiency of different fuels.

did you know ?

The smell of burned biodiesel is much more pleasant than the exhausted diesel fuel



## Activity 3 - one picture is worth 1000 words

- Understanding of problems and solutions by viewing images and formulating questions.
- Enhancing creative thinking.

## Activity 4 - critical reading of a scientific article

- The student will be asked to read a text from a scientific article, interpret graphs and tables and draw conclusions.

## Activity 5 - An experiment aimed at comparing the efficiency of fuels

**The students will:**

- Compare between gasoline, diesel and biodiesel (from used plant oil) by measuring the time which is needed to heat water to 50°C.
- Draw conclusions from the observation regarding the burning fuels.

## Goals

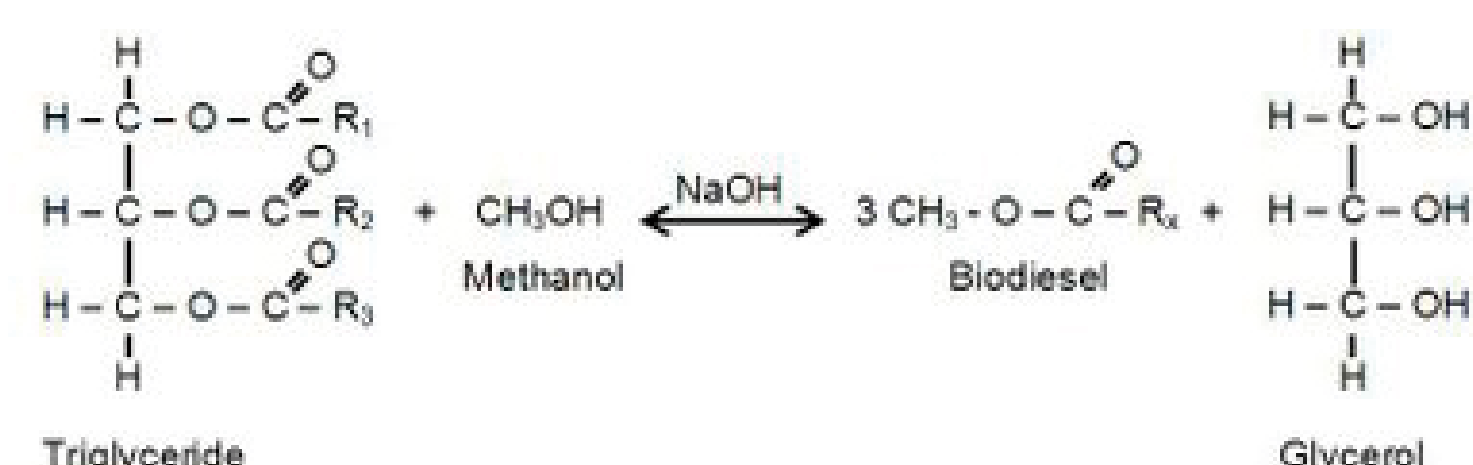
- Understanding the reasons for the energy crisis.
- Comparing of available fuels with biodiesel.
- Identification of the advantages and disadvantages of the fuels that are compared.
- Introduction to biodiesel: sources, efficiency and possible uses.

## Skills

- Critical thinking about advantages and disadvantages of different fuels.
- Searching for information about fuels.
- Asking questions, formulating hypotheses and planning an experiment.
- Presentation of results and conclusions.
- Decision making based on experiment results.

did you know ?

The first Rudolf diesel engine (1900) used peanut oil



## Evaluation

The evaluation of the students will be based on the criteria described in the following table  
Comment: Regarding the Decision making - each student will receive only one thinking tool.

Activity	Criteria for Evaluation
<b>Introduction</b>	Answers to questions showing understanding of problems, and formulation answers using scientific terminology.
<b>Comparison of fuels</b>	Finding and organizing relevant information in a table, and drawing conclusions.
<b>Experiment Design</b>	Designing according to stages of the scientific research.
<b>Image interpretation</b>	Team work that includes raising questions and critical thinking.
<b>Laboratory</b>	Recording and organizing the experimental results, discussion, and conclusions.

did you know ?

It is possible to produce at home biodiesel from used oil

did you know ?

Home production of biodiesel may help reduce the cost of fuel

