



GRADE 4 & 5 — A PLACE AND TIME

NATIONAL SCIENCE STANDARD

Geography: Understand how to apply geography to interpret the present and plan for the future.

OBJECTIVES

The student will:

1. locate on a map the countries that are the U.S.'s major suppliers of fossil fuels.
2. locate on a map the area of the U.S. that is the largest supplier of corn.
3. learn the events over the past 100 years that affected ethanol use.
4. consider the future of ethanol over the next 50 years.

BACKGROUND: THE PLACE

Ethanol production is growing. America is a bountiful country that has the ability to produce enough plant sources to meet an increasing demand for ethanol.

Corn use for ethanol more than doubled in just the 4 years between 2001 and 2005.

The majority of the ethanol plants are in the Midwest states of

- Iowa
- Illinois
- Minnesota
- Nebraska
- Kansas
- South Dakota
- Missouri

FAST FACTS

Three states account for 50% of the U.S. corn production.

- #1: Iowa
- #2: Illinois
- #3: Nebraska

In this geographic region, referred to as the Corn Belt, soils are deep, fertile, and rich in organic material and nitrogen. The land is relatively level. The warm nights, hot days, and well-distributed rainfall during the growing season make this area of the United States ideally suited for raising corn.

Ethanol plant growth

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|---------|--------------------|---|
| • 2000: | 54 ethanol plants | 1.74 billion gallons of ethanol |
| • 2006: | 100 ethanol plants | 4.5 billion gallons of ethanol produced |
| • 2008: | 140 ethanol plants | 7 billion gallons of ethanol to be produced |

Ethanol is produced from field corn, which is fed to livestock, not the sweet corn that human beings eat. Importantly, ethanol production utilizes only the starch portion of the corn kernel, which is abundant and of low value. The remaining vitamins, minerals, protein and fiber are still able to be sold as high-value livestock feed.

A PLACE AND TIME (CONTINUED)

BACKGROUND: THE TIME

1908 Henry Ford builds the Model T to run on ethanol, gas, or a combination

1917 & 1941 World War I & II increase need for fuel, and ethanol demand and production are driven up.

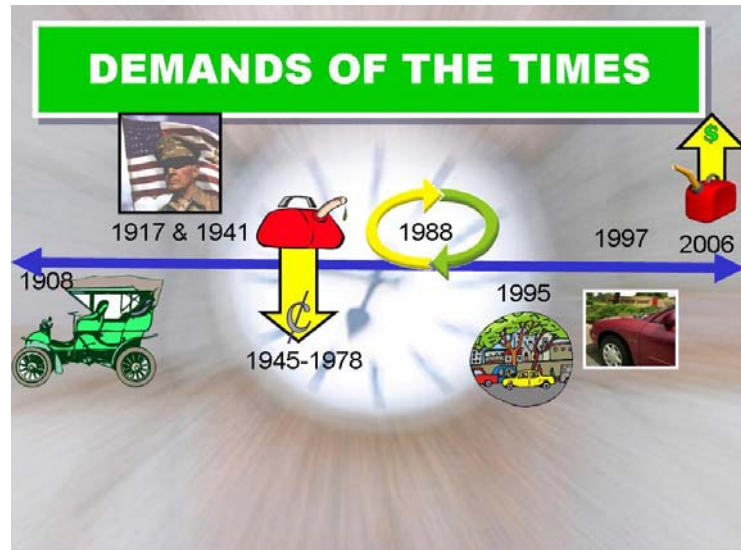
1945-1978 Reduced need for war materials and the low fuel prices drastically reduce ethanol production. From the late 1940s to the 1970s virtually no ethanol is available.

1988 Ethanol begins being added to gasoline to decrease pollution

1995 City with high smog levels are required to use gas with ethanol

1997 Car manufacturers begin producing cars that run on both gasoline and E85

2006 Gas prices high and unstable and desire for less dependence on foreign oil cause ethanol production to soar.



INSTRUCTIONAL PROCEDURE

1. On a map of the world mark where Americans get oil for fuel and where Americans obtain their source of corn for fuel.
2. Complete Activity 1.
3. Discuss the biofuels timeline.

ASSESSMENT

Have the student explain how it helps the earth to use renewable sources of energy. How will using renewable sources of energy affect you? Your children? Your grandchildren?

NAME _____

ACTIVITY 1 — GEOGRAPHY & FUEL

GEOGRAPHY AND FUEL

1. What are some of the limitations that geography imposes on access to oil for fuel?

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2. What geographical characteristics allow Iowa, Illinois and Nebraska to grow more corn than Colorado or Utah?

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3. How is the use of our land different today than in 1950's?

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NAME _____

ACTIVITY 2 — EXTENDING THE TIMELINE

THEORIZE

Extend the “Demands of the Time” timeline out for the next 50 years.

ANSWER

What do you expect to happen?

DISCUSS

Do you see the trends causing the current surge in ethanol production and usage to continue? Why or why not?

