

## NATIONAL SCIENCE STANDARD

- Personal and Social Perspectives: Types of Resources
- Life Science: The Characteristics of Organisms

## OBJECTIVES

The student will:

1. be able to identify the source of fossil fuels and biofuels.
2. be able to explain why fossil fuels are non-renewable.
3. be able to explain why plant sources of fuels are renewable.
4. understand the relation of natural resources in respect to use for fuel and food using a Venn diagram.

## BACKGROUND

Fossil fuels were formed from vegetation and animal life, including dinosaurs, deposited 380 to 245 million years ago.

As the plant and animal life died, they were buried under mud which gradually hardened as rock. The rotting plants and decayed animal were compressed between heavy layers of the rock and heated by the earth. Over million of years they changed into coal, oil, and natural gas deposits.

Although this process continues right now, we are using these fuels at several million times faster than they are being formed. Because they eventually can be completely used up they are considered nonrenewable.



“Bio” refers to living things. Fuels made from plants are called biofuels.

Corn, a very common crop in the Midwest, can be made into fuel. The corn is fermented and made into a liquid fuel. We can continuously plant and grow more corn; therefore, it is a renewable source of energy. Soybeans can also be made into fuel.

In the near future agricultural waste such as stalks, leaves and husks of corn will be able to be used, too. Long term plans include growing crops just for fuel such as fast-growing trees and grasses that can grow on land that will not support food crops.

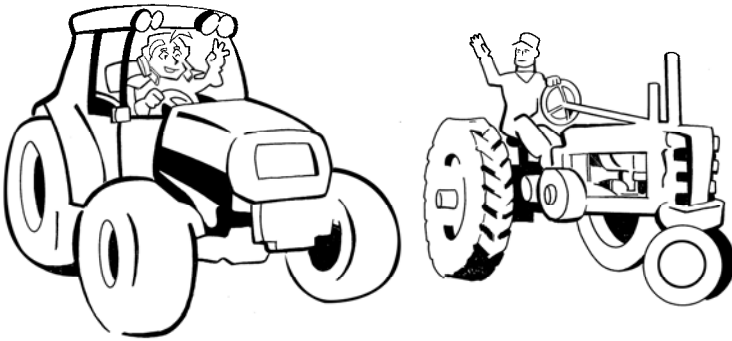
## FAST FACTS

Fuel made from corn is ethanol.

Fuel made from soybeans is biodiesel.

## INSTRUCTIONAL PROCEDURE

1. Discuss the difference between fossil fuels and biofuels.
2. Complete Activity 1 “Renewing Fuel.”
3. Complete Activity 2 “Food or Fuel?”



## ASSESSMENT

Have the student explain how it helps the earth to use renewable sources of energy. What affect will using renewable sources of energy have on you? On your children? On your grandchildren?

## WORD POWER

**biofuel** *n.* Fuel such as wood or ethanol, derived from biomass.

**biomass** *n.* Organic matter, esp. plant matter, that can be converted to fuel and is therefore regarded as a potential energy source.

**ethanol** *n.* Alcohol made from plant sources and used for fuel.

**renewable fuel** *n.* Fuel from sources that can never be used up.

**nonrenewable fuel** *n.* Fuel from sources limited in supply and can be used up.

**fossil** *n.* The remains or traces of an animal or a plant from millions of years ago, preserved as rock.

**fossil fuel** *n.* Coal, oil, or natural gas, formed from the remains of prehistoric plants and animals.

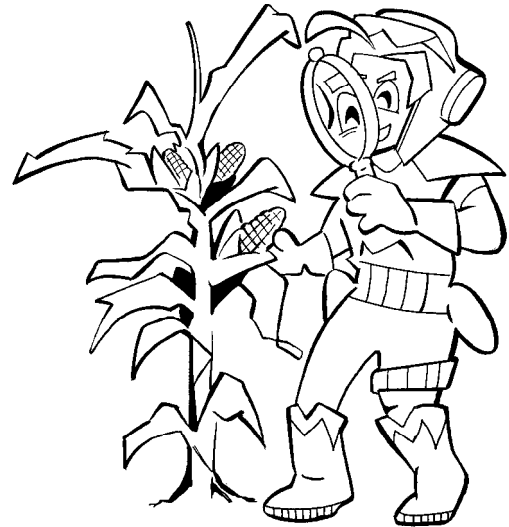
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## ACTIVITY 1 — RENEWING FUEL

### COMPARE AND CONTRAST

Preparation:

- Get 3 containers.
- Cut out the same number of fossils (from next page) as you have students.
- Cut out 50% more of the corn (from next page) as you have students. (Ex: 25 students, cut out 37 corns)
- Label container the containers as follows:
  - Container A: Oil Deposits
  - Container B: 1<sup>st</sup> Corn Planting
  - Container C: 2<sup>nd</sup> Corn Planting
- Place the fossils in Container A and the corn in Container B. Leave Container C empty.



### STEP 1: NONRENEWABLE FUELS DEMONSTRATION

1. Call on students at random to pull 1, 2, or 3 fossils from container A.
2. Ask the students about the outcome. Was everyone able to get fuel?

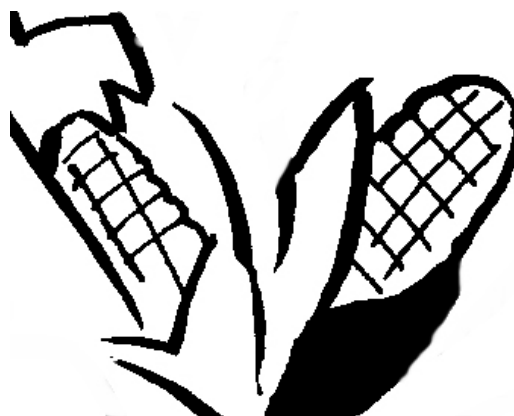
### STEP 2: RENEWABLE FUELS DEMONSTRATION

1. Call students at to pull corn from container B. Ask them to pick 2 and replant 1 in container C.
2. When container B is empty, have the student pick 2 from container C and replant one in Container B.
3. Discuss what happened. Will the corn ever run out?

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## ACTIVITY 1 — RENEWING FUEL, CONTINUED

CUTOUTS



NAME \_\_\_\_\_

## ACTIVITY 2 — FOOD OR FUEL?

### VENN DIAGRAMS

Draw a Venn diagram showing the relation of the natural resources in the Resources List.

#### RESOURCES LIST

- CORN
- SOYBEAN
- TREES
- GRASS
- SOIL
- WATER
- AIR
- PETROLEUM OIL
- COAL
- PLANT WASTE PRODUCTS
- PEANUTS
- VEGETABLE
- FRUIT

#### NATURAL RESOURCES

