

Some people have proposed that ethyl alcohol (ethanol), which can be produced from corn, should be used in automobiles as a substitute for gasoline.

1. Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

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Question 1

**Scoring Guide**

Score & Description
<b>Complete</b> Student response must discuss two ways that substituting ethyl alcohol for gasoline could impact the environment in either negative and/or positive ways. For example, less air pollutants may result leading to improved air quality; forests may have to be cleared for crop growth resulting in habitat destruction and increased carbon dioxide concentrations in the atmosphere; and stocks of fresh water may be depleted due to increased crop irrigation.
<b>Partial</b> Student response discusses one positive or one negative environmental impact that could result from substituting ethyl alcohol for gasoline.
<b>Unsatisfactory/Incorrect</b> Student response does not discuss any environmental impacts that could result from substituting ethyl alcohol for gasoline.

**Complete - Student Response**

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

We would need a lot more land, soil, and money to grow enough corn to feed people and to put in cars. We would have to cut down forests, causing to higher Co2 levels and making more animals endangered. We would need more irrigation, using up our small% of drinkable water.

Scorer Comments:

Student response discusses a number of valid environmental impacts. For example, forests would have to be cut down to make way for growing corn. This would lead to higher carbon dioxide levels. Water would be needed to irrigate crops, thus reducing the amount of drinking water.

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

One impact it would have is it would reduce pollution. Another impact would be it would reduce the need to drill for oil, thus preserving more wilderness areas.

Scorer Comments:

Student response mentions two valid environmental impacts, a reduction in pollution and the preservation of wilderness areas due to a reduced need to drill for oil.

**Partial - Student Response**

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

It would be better for the environment because it wouldn't put as much fumes off as gasoline and pollute the air and it more natural than gas because gasoline isn't natural.

Scorer Comments:

Student response discusses one valid environmental impact, stating that not as many fumes would be given off to pollute the air.

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

If a boat was carrying it and crashed the sea animals wouldn't be affected by it. Also in it leaked from a car no one would be affected by it.

Scorer Comments:

Student response mentions one valid environmental impact, no damage to sea creatures during a spill, implying that when oil needed for manufacturing gasoline is spilled during ocean transport, there is much damage to sea life.

**Unsatisfactory/Incorrect - Student Response**

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

We would have more oil. This would help the environment. However, we might run out of corn.

Scorer Comments:

Student response consists of general statements only, with no clear indication of any environmental impact that would result from substituting ethyl alcohol for gasoline.

- 1 Discuss two environmental impacts that could result from substituting ethyl alcohol for gasoline.

The gas + alcohol could  
make an explosion.  
It will waste easily

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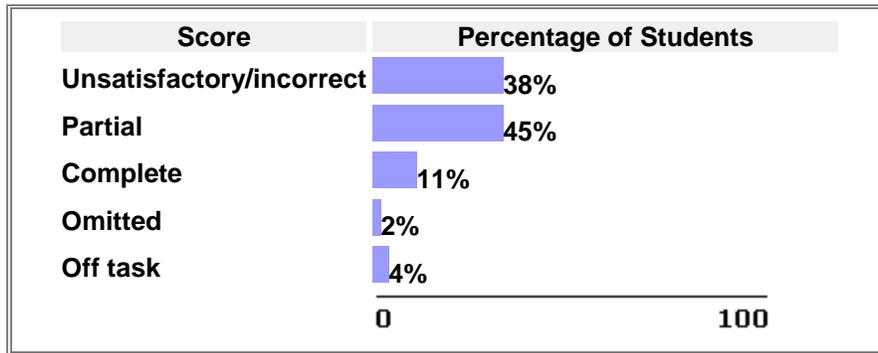
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Scorer Comments:

Student response does not take into account the environmental impact of substituting ethyl alcohol for gasoline, mentioning only that the gas and alcohol could make an explosion, and that it (ethyl alcohol) will waste easily.

## 2000 National Performance Results



Note:

- These results are for public and nonpublic school students.
- Percentages may not add to 100 due to rounding.

**The Fields of Science:** *Physical Sciences* (Sub content classification: *Energy and Its Transformations*)

**Knowing and Doing Science :** *Practical Reasoning*

### The Fields of Science

#### *Physical Sciences*

This question measures basic knowledge and understanding of the following:

### Knowing and Doing Science

#### *Practical Reasoning*

Practical reasoning probes students' abilities to use and apply science understanding in new, real-world applications.