

Alternative Fuels

Introduction

The economic and environmental concerns associated with using gasoline as the primary fuel for motorized vehicles have increased the demand for alternative fuel sources. Some alternative fuels can be added to gasoline to reduce its overall cost. Other alternative fuels can be used directly in present-day engines. Most alternative fuels are renewable resources because they can be replaced easily and will not run out.

However, gasoline is made from petroleum, a nonrenewable resource that can run out. Burning gasoline in engines also generates pollution.



Task

Your job in this WebQuest is to discover what alternative fuels are and learn how using these fuels in vehicles can reduce overall air pollution. You will explore different types of alternative fuels and identify one alternative fuel that you support. The alternative fuel that you choose should be cost effective, generate a minimal amount of pollution, and have a minimal impact on the environment.

Process

Use the resources listed to identify and explore the different alternative fuels available. Keep in mind that not all Web sites are written specifically for students. Some of what you read might be challenging. Look for information that will be useful in completing this WebQuest. Weigh the costs and benefits of each alternative fuel and decide which one you think is best. Answering the questions below about alternative fuels will help guide your research.

1. What is an alternative fuel?
2. Give three examples of alternative fuels.
3. What is biomass?
4. Give three examples of biomass fuels.
5. What are the four types of biomass that can be converted into alternative fuels?
6. What is bioenergy?
7. What is biodiesel fuel? What is it made from?
8. What is ethanol? What is it made from?
9. What is methanol? What is it made from?
10. How is biomass converted to ethanol?

After completing your research and identifying an alternative fuel that you support, write a letter to an elected official explaining the benefits of your alternative fuel, and why your alternative fuel, instead of gasoline, should be used to power vehicles. How will the fuel help save money? How will its use benefit the environment? Once you have completed your letter, present your work to the class. Use visual aids to help support your argument.

Resources: Use the Internet to research this topic. Be sure to access reliable information. The following searches might be helpful.

Alternative Fuels and Data Center
(<https://afdc.energy.gov/>)

- Search: various fuels and data

United States Environmental Protection Agency (epa.gov)

- Search: "Alternative Fuels"

U.S. Department of Agriculture: Farm Service Agency (fsa.usda.gov)

- Search "Energy Programs"

U.S. Department of Energy (energy.gov)

- Search: "Clean Energy"

National Renewable Energy Laboratory
(nrel.gov)

- Search: "Energy Basics"

Evaluation

Read this rubric to determine how you will be scored in this WebQuest.

| Criteria | | | | | Points |
|---------------------|--|--|---|--|--------|
| | 1 | 2 | 3 | 4 | |
| Task | The task was not completed. | It appears that some effort was made to complete the task, but major ideas are missing. | The task was completed as assigned, but some of the rationale for the design was faulty. | The task was completed with great attention to detail and thorough documentation. | |
| Process | The process was not followed. | The research was complete, but the design and presentation could have been better organized. | All the steps of the process were followed and the design was good. | It is clear that much effort went into the project. The ideas show a high degree of originality and imagination. | |
| Presentation | Presentation was sloppy and not well prepared. | The presentation included key ideas but lacked general cohesiveness. | The presentation was well organized with only minor errors. | Presentation is well organized, ideas are clearly stated, and visual aids are well utilized. | |
| Letter | Letter was not completed, or it appeared that little effort went into the project. | Letter was well researched but lacked some key features needed for accomplishing the task. | Letter was well thought out and included arguments that were clearly supported by research. | Letter was organized and arguments were well supported. It is evident that much research went into the project. | |

Conclusion

In the process of completing this WebQuest, you explored the different alternative fuels that can be used to power vehicles. You learned what biomass is and how it can be used to produce a wide variety of alternative fuels. In addition, you learned more about renewable energy resources. You also developed research skills as you explored different Web sites and identified relevant information to develop and support a scientific argument.