

Alternative Fuels



1. Explain the difference between a conventional fossil fuel and an alternative fuel?
2. Briefly describe each of the following alternative fuels and their benefits:
 - a. Algae-based fuel
 - b. Bio-alcohol
 - c. Biodiesel
 - d. Hydrogen
 - e. Electricity
 - f. Ethanol
 - g. Liquid Nitrogen
 - h. Methanol
 - i. Natural Gas
 - j. Non-fossil Methane
 - k. Nuclear Power
 - l. Propane
 - m. Vegetable oil
3. Discover at least three reasons why alternative fuels are important?
4. What are some advantages and disadvantages of alternate fuels?
5. Illustrate through drawings, sketches or photographs the elements that make up natural gas.
6. Explain the difference between compressed natural gas and liquefied natural gas?
7. Draw the steps or view an electronic animation that illustrates the alternate fuel conversion process as used in the automobile industry.
8. Describe how a propane vehicle operates.
9. Discuss with a group the importance of finding alternative fuel methods.
10. Do two of the following individually or as a group:
 - a. Visit a facility that produces an alternative fuel of your choice. Prepare and give an oral presentation on your activity.
 - b. Create a science project demonstration that illustrates how an alternative fuel can be used.
 - c. Have someone who works in the alternative fuels industry come and speak to you or your group.
 - d. Calculate and demonstrate cost savings for modern alternative fuel/hybrid vehicles. Demonstrate your finding through a presentation, display or verbal report.
11. Discuss with a group the following texts as they relate to alternative fuels.

Note: This is an open question designed to allow pathfinders to think freely with the guidance of an instructor.

- a. Psalm 24:1
- b. Colossians 1:16-17
- c. John 1:3

Skill Level 2

New in 2014

Nature
North American Division
2014 Update

Alternative Fuels, Advanced

1. Have the Alternative Fuels honor
2. Describe the process of hydraulic fracturing.
3. Describe the process of offshore drilling.
4. What are some of the safety concerns of offshore drilling?
5. Draw a diagram that explains how natural gas is extracted and processed for use.
6. Explain how natural gas can be used:
 - a. Producing hydrogen
 - b. Generating power
 - c. Transportation
 - d. Power source
7. Natural gas is used to make what type of products? Explain the process for at least two of your answers.
8. How is ethanol produced?
9. Discuss with a group some of the environmental effects regarding the use of alternative fuels.

Skill Level 3

New in 2014