Purchase Vehicle Instructions

Part 1: Research Requirements
Pick one gasoline powered vehicle (under $25,000) and one alternative fuel powered vehicle (under $30,000) that you would like to purchase. Use the Internet sites listed in Part 3 of this document to find the following information:

1. Model and year
2. Type of engine
    a. State the amount of horsepower
    b. Explain the technologies used on the vehicle
3. Type of fuel used
    a. Explain how the fuel is developed and find evidence of the impact on the environment
    b. Research the environmental impact of burning the fuel
    c. Research the safety issues associated with the fuel source
    d. Record the emissions testing for the vehicle—include the amount of carbon dioxide, carbon monoxide, and nitrogen oxide
    e. Research the availability of the fuel source
    f. Create an extensive chart of advantages and disadvantages for each fuel source, and compare data side by side
    g. Calculate the total number of miles you normally travel during a year; find the percent of miles driven in the city and on the highway, and show your system for finding the number of miles you drive per year
    h. Find the miles per gallon of your vehicle for both highway and city driving; calculate the total fuel costs for one year if gasoline is $2.85 a gallon and find the current price for your chosen alternative fuel
    i. Include any other information you find interesting about your vehicle, such as the reasons you like the vehicle

Part 2: Vehicle Comparison Requirements
Choose one of the following options to investigate and report:

- For each of the main alternative fuel vehicles, compare the total number sold in the United States in the last five years. Decide the best way to graphically represent and compare this data. Explain your rationale for your chosen method. Evaluate the meaning of the graphical representation(s).
- Compare the total number of alternative fuel vehicles sold in the United States compared to other developed countries, such as Japan, Switzerland, Great Britain, Germany, France, Canada, and Australia, in the last five years. Decide on the best way to graphically represent the data. Explain your rationale for your chosen method. Evaluate the meaning of the graphical representation(s).
- Compare the total number of alternative fuel vehicles sold in California, New York, Washington, Colorado, Texas, Florida, Michigan, and so forth. Consider the number of people in each state when comparing numbers. Decide on the best way to graphically represent the data. Explain your rationale for your chosen method. Evaluate the meaning of the graphical representation(s).

Part 3: Data Analysis Requirements
Use the following list to identify and include the appropriate data analysis methods of your vehicle project to reveal more meaning:

- Find median, mode, and mean

- Use box plots

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- Find line of best fit, curve of best fit, and slope
- Identify type of data—categorical, measurement, variable, independent, univariate (histograms, mean, median, mode, SD, percentiles), or bivariate (scatter plots)
- Identify variables
- Use scatter plots to explain correlation data, regression line, and trend
- Use histograms for distribution of process data set—vertical shows frequency; horizontal show variable; and distribution data has a center, shape, variation, outliers, and symmetry
- Bar charts for groups of data

Use the following Internet Resources for Your Research:

- Drive Clean California
  www.driveclean.ca.gov/en/gv/home*
  Information on the different types of automobiles that use alternative fuels
- United States Department of Energy
  www.fueleconomy.gov/feg/feg2000.htm*
  Downloadable fuel guides for the years 2000–2007
- United States Department of Energy
  www.eere.energy.gov/afdc/afv/afvehicles.html*
  Alternative fuel data center
- United States Department of Energy
  www.eere.energy.gov/fleetguide/hevcalc.html*
  Clean Cities' HEV Cost Calculator allows fleets to compare the costs, benefits, and emissions of hybrid electric vehicles (HEV) with those of conventional vehicles
- National Energy Foundation
  www.nef1.org/ftf*
  Information on alternative fuel vehicles
- American Hydrogen Association
  www.clean-air.org*
  Facts and figures for automobiles fueled by hydrogen
- California Energy Commission
  www.energyquest.ca.gov/transportation/electric.html*
  A student's guide to alternative fuel vehicles
- National Biodiesel Board
  www.biodiesel.org/resources/fuelfactsheets/default.shtm*
  Biodiesel fact sheets
- National Energy Foundation
  www.nef1.org/ftf/links.html*
  An extensive list of Internet resources on alternative fuels
- Drive Clean Across Texas
  www.drivecleanacrosstexas.org/for_teachers/grades_9-12*
  A collection of lesson plans on air quality and alternative fuels
- National Biodiesel Board
  www.biodiesel.org/pdf_files/fuelfactsheets/emissions.pdf* (PDF; 2 pages)
  Facts and figures on biodiesel emissions
- All About Hybrid Cars
  www.allabouthybridcars.com/alternative-fuel.htm*
  Advantages and disadvantages to hybrid automobiles
- Alternative Fuels Data Center
  www.fueleconomy.gov/feg/current.shtml
  Information of tax incentives, alternative fuels, and alternative fuel vehicles