

# Car Comparison Project



## ***Introduction***

Systems of linear equations are a useful way to solve common problems in different areas of life. One of the most powerful ways to use them is in a comparison model where two similar situations are compared side by side to determine which one is better. In this project, you will be choosing two cars that you are interested in purchasing and then using systems of linear equations to decide which one is the better buy for you.

## ***Car Comparison***

Situation: Your job requires you to be on the road a lot and therefore your company will buy you a vehicle. However in order to buy the vehicle you need to demonstrate to your company that you have researched your options and are purchasing the most economical vehicle you can. You are trying to decide between getting a hybrid or a regular sedan. The hybrids cost more upfront, but get better gas mileage, so it will cost less to drive. Regular cars cost less upfront, but get worse gas mileage, so they will cost more to drive.

For this project, you will need to choose one hybrid car and one regular mid-sized sedan car from the list given below. Please circle one car from each list. Make sure that each car is new and is from the same year.

### **Hybrids**

Toyota Prius  
Chevy Volt  
Honda Civic Hybrid  
Toyota Camry Hybrid  
Ford Fusion

### **Regular Sedans**

Ford Focus  
Honda Accord  
Chevy Malibu  
Chrysler 200 Limited  
Ford Taurus

Assignment: You will collect information (price of the car, gas mileage, and mileage cost) for each car you choose. Then you will create a system of linear equations for the two cars and create a graph to determine which car will be the better buy for you. You will be completing and turning in this packet as well as a power point as your final products for the project. You may use these websites as a helpful resource:

- <http://www.fueleconomy.gov/>
- <http://www.edmunds.com/>

**Project Steps...**

Step 1 – Research your cars online.

	<b>Hybrid:</b>	<b>Regular Sedan:</b>
<b>Cost (\$)</b>		
<b>Gas Mileage (miles/gallon) City</b>		

Step 2 – Calculate the rate it would cost each car to drive 1 mile. Round your answer to the nearest ¢ (penny). In order to do this, please use the gas cost of \$3.5 per gallon.

	<b>Hybrid:</b>	<b>Regular Sedan:</b>
<b>Mileage Cost (\$/mile)</b>	Work:	Work:
	Answer:	Answer:

Step 3: Create the linear equation for each car. Let x represent the number of miles that you have driven the car and y represent the total cost of the car to that point.

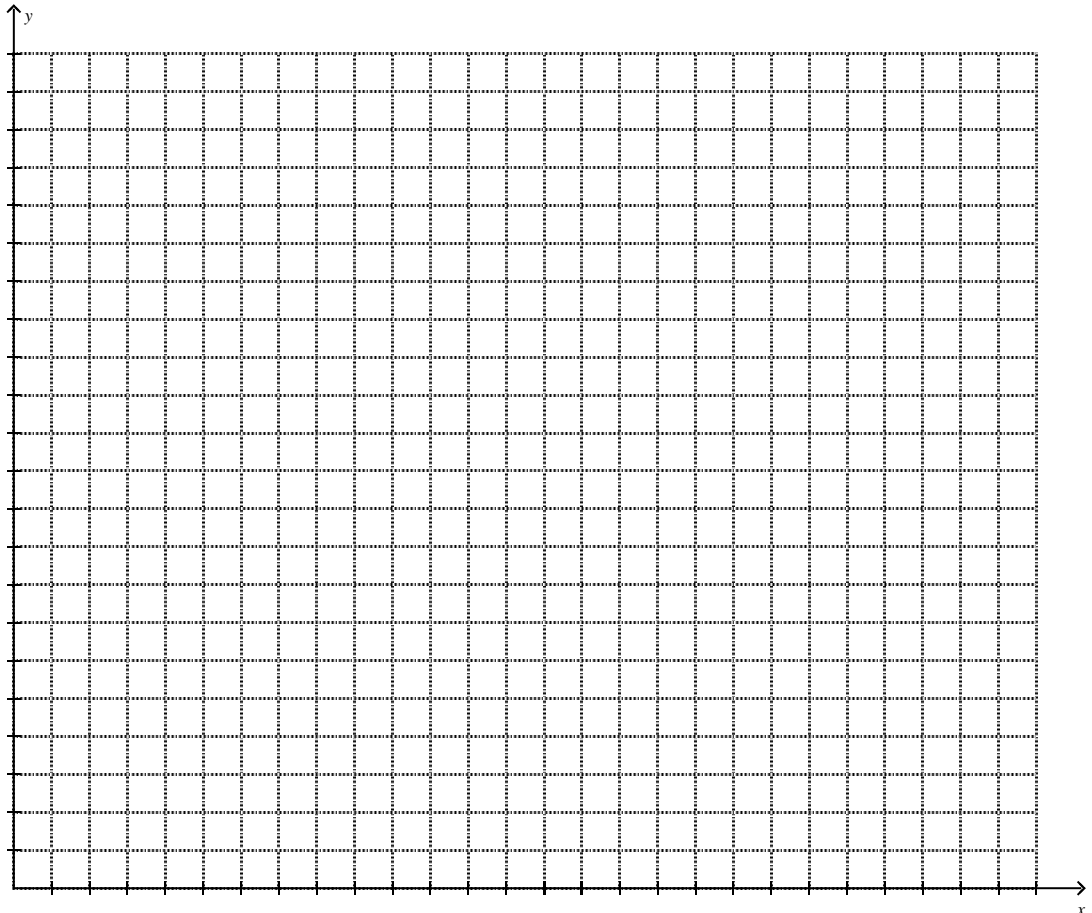
	<b>Hybrid:</b>	<b>Regular Sedan:</b>
<b>Equation</b>		

Step 4: Solve the system of linear equations both graphically and algebraically. In case you may have forgotten, solve algebraically means solve by substitution and by elimination.

To help you graph, complete the table below to figure out some data points to plot:

Number of Miles driven $x$	Total Cost of Purchasing & Driving the HYBRID $y$	Total Cost of Purchasing & Driving the REG. SEDAN $y$
0		
10,000		
20,000		
30,000		
40,000		
50,000		

Solve By Graphing:



Label:

\_\_\_\_\_

Label: \_\_\_\_\_

My solution is (                      ).

**Solve by Substitution:**

Equations: \_\_\_\_\_  
\_\_\_\_\_

My solution is (                      ).

**Solve by Elimination:**

Equations: \_\_\_\_\_  
\_\_\_\_\_

My solution is (                      ).

Step 5: Distinguish the meaning of your solution as it relates to the new car scenario.

Step 6: You need to create a power point for your company showing them the comparison between the two cars, and explaining which car will be the better buy.

Your power point should include the following...

2. A title page. You must also have your name and the hour of your Math class.
3. A table illustrating the comparison of the hybrid and the regular car that includes...
  - Price of each car
  - Gas mileage of each car
  - Mileage cost of each car
  - Equation for each car
4. Graph showing the cost comparison between the hybrid and the regular car. See your teacher for further directions on this part.
5. A statement explaining the meaning of the solution of the system.
6. A final statement explaining which car is the better buy for you and why.

Step 7: Share your power–point with me via google docs. Send it to my email address: [royd@dewittschools.net](mailto:royd@dewittschools.net)

Step 8: Turn in your project packet and rubric.

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

<b>Car Comparison Project – Grading Criteria</b>		Rubric Score
<b>Research</b>	<ul style="list-style-type: none"> <li>○ Car research complete. _____/4</li> </ul>	<hr style="width: 20px; margin: 0 auto;"/> 4
<b>Handwritten Work</b>	<ul style="list-style-type: none"> <li>○ Mileage Costs Calculated. _____/4</li> <li>○ Total Cost Equations are written. _____/4</li> <li>○ System Solved By Graphing (estimation only)               <ul style="list-style-type: none"> <li>-Axis Labeled _____/1</li> <li>-Axis correctly scaled. _____/1</li> <li>-Lines correctly Graphed _____/2</li> <li>-Solution Accurately Estimated _____/1</li> </ul> </li> <li>○ System Solved By Substitution. _____/5</li> <li>○ System Solved By Elimination. _____/5</li> <li>○ Solution Interpreted Correctly _____/2</li> </ul>	<hr style="width: 20px; margin: 0 auto;"/> 25
<b>Power-point</b>	<ul style="list-style-type: none"> <li>○ Title Page (with name &amp; hour) _____/2</li> <li>○ Table _____/4               <ul style="list-style-type: none"> <li>___ Price</li> <li>___ Gas Mileage</li> <li>___ Mileage Costs</li> <li>___ Equations</li> </ul> </li> <li>○ Graph _____/10               <ul style="list-style-type: none"> <li>___ Title</li> <li>___ Axis are labeled</li> <li>___ Legend Correctly Labeled</li> <li>___ Accurate</li> </ul> </li> <li>○ Solution Interpreted _____/2</li> <li>○ Argument               <ul style="list-style-type: none"> <li>-Sound argument</li> <li>-Complete Sentences</li> </ul> </li> <li>○ Professional Appearance _____/3               <ul style="list-style-type: none"> <li>___ organized</li> <li>___ appears professional</li> <li>___ Grammar, punctuation, spelling</li> </ul> </li> </ul>	<hr style="width: 20px; margin: 0 auto;"/> 21

Total = \_\_\_\_\_/50