

Lesson Title: <b>How Linear Equation can be applied to Real Life situations?</b>	Lesson 2
--	----------

Author(s): Ruthie Pegues Guy Newsom	Phone Number(s): 720.423.5402 720.423.5562	E-mail Address(es): <a href="mailto:ruthie_pegues@dpsk12.org">ruthie_pegues@dpsk12.org</a> <a href="mailto:guy_newsom@dpsk12.org">guy_newsom@dpsk12.org</a>
--	--	---

Lesson Objective:	<p><b>Standard 8:</b> The student will demonstrate and apply marketing functions and strategies both domestically and internationally.</p> <p><b>Benchmark 8-5:</b> Explain the role of pricing in the marketing process and describe and use various pricing strategies.</p> <p><b>Objective:</b> After completion of this lesson, students will be able to calculate the price for rental cars and compare the rates by using algebraic expressions. They will also learn to graph their result. As an enrichment exercise the students will use systems of equations to find when the price of each rental car will be the same.</p> <p><b>Note to Teacher:</b> This is an introductory lesson for rental car pricing and also a beginner’s lesson for using the graphic calculator.</p>
-------------------	---

Supplies Needed:	<table style="width: 100%; border: none;"> <tr> <td style="border: none;">Pretest</td> <td style="border: none;">Graphic calculator</td> <td style="border: none;">Post Test</td> </tr> <tr> <td style="border: none;">Student worksheets</td> <td colspan="2" style="border: none;">graphing paper.</td> </tr> </table>	Pretest	Graphic calculator	Post Test	Student worksheets	graphing paper.	
Pretest	Graphic calculator	Post Test					
Student worksheets	graphing paper.						

<b>THE "7 ELEMENTS"</b>	<b>TEACHER NOTES (and answer key)</b>
<p><b>1. Assess students’ math awareness as it relates to the CTE lesson.</b></p> <p>The teacher will pass out the pretest. Students will work on this individually to complete the pretest.</p>	<ul style="list-style-type: none"> <li>Have students complete the pretest for today’s lesson.</li> <li>Now ask students to use “thumb up” if they could do</li> </ul>

<p><b>2. Introduce the CTE lesson.</b></p> <p>The student will give the students the following scenario:</p> <p>Congratulations! You all were selected through a lottery to travel expenses paid (except for a rental car) to Cape Canaveral to see the launch of Centaur 5. You will need transportation for the tour to NASA and the different activities that we have planned. We do recommend three rental car companies that will be willing to give you quotes and a possible discount. Lets work together to see which company will give us the best deal.</p> <p>Give each team a rental car company key labeled with the daily cost.</p>	<p>problem 1 or “thumb down” if they could not do the problem. Do all three problems having student response.</p> <p>Give each team a key with the description of the vehicle, the rate, and the price per mile.</p> <p>Have each group give the name, and all the information for their rental car company</p>
<p><b>3. Work through the math example <i>embedded</i> in the CTE lesson.</b></p> <p>Have Mertz Rental Car group give you the information for their rental car.</p> <p>Show the students a formula for figuring the cost per day including mileage.</p> <p>Work through each rental car quote.</p> <p>Have Saver Rental Car group give you the information on their rental car</p>	<p>You need to rent a car.</p> <p>Mertz Rental charges \$32 per day plus \$0.10 per mile.</p> <p>Saver Rental charges \$24 per day plus \$0.18 per mile.</p> <p>Luxury Rental charges \$51 per day with unlimited mileage.</p> <p>Now: Compare the cost of rental for a day for each one of the rental companies.</p>

Have the Luxury Rental give you the information to setup formula for that rental company.

Have students insert to miles traveled per rental car company. Mertz complete the cost if traveled 50 miles.

Have students figure the price for Saver Rental company

Have students figure the price for Luxury Rental Car formula

#### 4. Work through related, contextual math-in-CTE examples.

Have students figure the price if they traveled 150 miles using the

Lets:

Write a cost equation for each car rental companies.

#### Saver Rental equation:

$$C = \$24 + .18m$$

#### Luxury Rental

$$C = \$51 + .00m$$

Have students to rework the problems using different mileage factors so that they can compute the cost and decide which rental car company gives them more bangs for the buck.

1a.  $x = 50$  miles

#### Solution:

$$\text{Mertz } C = \$32 + \$.10m$$

$$C = \$32 + .10*50$$

$$C = \$32 + 5$$

$$C = \$37$$

Explain that cost is determined by adding the rate plus the mileage + number of mile multiplied by the price per mile.

$$\text{Saver } C = \$24 + .18m$$

$$C = \$24 + .18*50$$

$$C = \$24 + 9$$

rental car.

Have students figure the price if they traveled 200 miles using the rental car.

Figure the rate with 200 miles for Luxury Rental Car.

$$C = \$33$$

Luxury  $C = \$51 + .00m$

$$C = \$51$$

**2a.  $x = 150$  use your formula to figure rate**

Mertz  $C = \$32 + \$.10m$

$$C = \$32 + .10 \cdot 150$$

$$C = \$32 + 15$$

$$C = \$47$$

Saver  $C = \$24 + .18m$

$$C = \$24 + .18 \cdot 150$$

$$C = \$24 + 27$$

$$C = \$51$$

Luxury  $C = \$51 + .00m$

$$C = \$51$$

**3a.  $x = 200$  use your formula to figure rate**

Mertz  $C = \$32 + \$.10m$

$$C = \$32 + .10 \cdot 200$$

$$C = \$32 + 20$$

$$C = \$52$$

Saver  $C = \$24 + .18m$

$$C = \$24 + .18 \cdot 200$$



<p>Continue the math formula</p>	<p>X = miles  Y = \$24 + .18*m  Y = \$24 + (.18 * 250)  Y = \$24 + 45  Y = \$69</p> <p><b>Luxury Rental Car:</b>  Y = Cost  X = Miles  Y = \$51 + \$.0*m  Y = \$51</p> <p>Complete one problem with the students, and then assign the other problems as guided practice.</p>
<p>Use a math formula to show how to solve for two variables y and x.</p> <p>You can now plot the point for your calculations.</p>	<p>This is what the math class same problem look like:</p> <p>(1) <math>y = 2x - 4</math></p> <p>Solution: If <math>x = 2</math>      <math>x = 3</math>  <math>Y = (2 * 2) - 4</math>      <math>Y = (2*3) - 4</math>  <math>Y = 4 - 4</math>      <math>Y = 6 - 4</math>  <math>Y = 0</math>      <math>Y = 2</math></p>

	<table border="1"> <tr><td>X</td><td>y</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>2</td></tr> </table>	X	y	2	0	3	2												
X	y																		
2	0																		
3	2																		
<p><b>6. Students demonstrate their understanding.</b></p> <p>Have students work problems 2 thru 4, if time permits, have them plot the points.</p> <p>Let students know that they can check their problems for errors.</p>	<p>(2) <math>y = 3x + 6</math></p> <table border="1"> <tr><td>X</td><td>Y</td></tr> <tr><td>2</td><td>12</td></tr> <tr><td>3</td><td>15</td></tr> </table> <p>(3) <math>y = 2x + 3</math></p> <table border="1"> <tr><td>X</td><td>Y</td></tr> <tr><td>4</td><td>11</td></tr> <tr><td>5</td><td>13</td></tr> </table> <p>(4) <math>y = 7</math></p> <table border="1"> <tr><td>X</td><td>Y</td></tr> <tr><td>0</td><td>7</td></tr> <tr><td>0</td><td>6</td></tr> </table>	X	Y	2	12	3	15	X	Y	4	11	5	13	X	Y	0	7	0	6
X	Y																		
2	12																		
3	15																		
X	Y																		
4	11																		
5	13																		
X	Y																		
0	7																		
0	6																		

**7. Formal assessment.**

Pass out the Post test and allow students to complete the form.

See attachment.