

Algebra Activity 1: Prices are Soaring

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CALCULATORS: Casio: *fx-9750G Plus* • Casio: *CFX-9850G Series*

Teaching Notes/Lesson Plan Level: Algebra 1

Objective

To familiarize students with the available data manipulations that can be performed using either Casio calculator. The operations in this lesson are entering, transferring, graphing, and exploring data lists. After graphing lists, students will be able to find the line of best fit and discuss the results.

Engage

Discuss with students the reasons for the changes in gasoline prices. Discuss the gimmicks that are used by the gasoline companies in order to lure more customers.

Explore

1. Using the data provided on the included data sheet, have students enter the numbers 1 through 10 into List 1 in the Statistics Menu and the gasoline prices into List 2.
2. The student should graph the scatter plot to represent the data.
3. The student should find the line of best fit and copy this into the Graph and Table menu.
4. The student should set the range of the x -values to go from 13 to 24.
5. The student should complete the worksheet using the given information.

Explain

Students should explain the various changes using the list of reasons previously discussed. The discussion should include an explanation of the slope and how it relates to the change in the gasoline price

Elaborate

Students can discuss the results of the activity in relation to types of cars and types of driving.

Evaluate

Give students alternate lists of data to manipulate as instructed. Students should write an explanation for their data observations.

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Student Worksheet Activity 1

Objectives

The student will be able to:

1. Graph a set of data comparing months to gasoline prices,
2. Calculate statistics involving the set of data, and
3. Solve problems using the data and calculations

Data

Month	Cost per Gallon	Month	Cost per Gallon
January	1.74	July	1.87
February	1.76	August	1.83
March	1.72	September	1.84
April	1.78	October	1.93
May	1.81	November	1.95
June	1.84	December	2.05

Procedure

1. Turn on the calculator, use the arrow keys to highlight the Statistics Menu and press **EXE**.
2. Enter the numbers 1 through 12 into List 1 to represent the months pressing **EXE** after each number.
3. Move the cursor into List 2 and enter each of the prices pressing **EXE** after each price.
4. Press **F1**(GRPH) **F6** and the **Down Arrow** to get to GraphType. If it does not say Scatter, press **F1**, otherwise press the **Down Arrow** key.
5. The XList should say List 1. If it does not, press **F1**.
6. Press the **Down Arrow** key. The YList should say List 2. If it does not, press **F2**. Press **EXE**.
7. Press **F1** to see the graph. Press **F1** to get the equation for the line of best fit.
8. Press **F5** and **EXE** to enter this equation into the GRAPH and TABLE Menus. Press **F6** to see the graph.
9. Press **EXIT** twice, then **F2**. Press **F6 F2 EXE**. Press **F1** to see the statistics for the cost per gallon.
10. Press **MENU** and the Down Arrow key to get to the TABLE Menu. Press **EXE**.
11. Press **F5 13 EXE 24 EXE** and **EXE** again to set up the table to see the predicted prices for the next twelve months. Press **F6** to see the table.

Student Worksheet Activity 1**Problems**

1. The graph appeared to be linear. When you found the equation for the line of best fit, what was the value of r on the screen? _____
Is this value close to 1? _____
If it is, then the equation is a good fit for the data. Write the equation. _____
2. Find each of the following for the given data:
Mean Cost per Gallon _____
Median Cost per Gallon _____
Range of Costs per Gallon _____
3. Find each of the following values using the table from the calculator:
 - a. Cost of Gasoline next January? _____
Next March? _____
Next September? _____
 - b. What is the predicted cost of filling up a 15 gallon tank with gasoline next July?

4. If a family is planning a trip next June by car, answer the given questions:
 - a. The car used for the trip averages 19 miles per gallon. If the distance one way to the vacation spot is 250 miles, approximately how many gallons of gasoline will they need to complete the round trip?

 - b. While at the vacation spot, the family estimates they will travel 136 miles. How many more gallons of gasoline will they need?

 - c. What is the total estimated number of gallons the family will need for the trip?

How much do they estimate the cost will be?

 - d. How much would you suggest they budget for gasoline on their trip? Why?

5. Suppose in January of the next year the price averages \$2.11, February averages \$2.16, and March averages \$2.19, what would be the new predicted cost for a gallon of gasoline next June?

How much would this increase the budget for gasoline for the trip? _____
6. If this were you, what are some of the ways you could save on gasoline during the trip?

Solutions to Activity 1: Prices are Soaring

1. $r = 0.92$; Yes, it is a good fit.; $y = .024x + 1.68$

```

LinearReg
a =0.02440559
b =-1.68469697
r =0.92075993
r^2=0.84779835
y=ax+b
    
```

COPY DRAW

2. Mean = \$1.84; Median = \$1.835;
Range = \$2.05 - 1.72 = \$0.33

```

1-Variable
SUM =1.84333333
SUMX =-22.12
SUMX^2 =40.875
Σσn =0.09149934
Σσn-1 =0.09556847
n =12
    
```

1-VAR 2-VAR REG SET

3. Jan. - \$2.00; Mar. - \$2.05;
Sept. - \$2.20; \$32.25

X	Y1
12	2.0019
14	2.0263
15	2.0507
16	2.0751

FORM DEL ROW 13
G-CON G-PLT

4. 23.6 gal.; 7.2 gal.; 33.5 gal.; \$71.02; Answers will vary.
5. \$2.23; $\$74.71 - \$71.02 = \$3.69$
6. Answers will vary.