Math TODAY™
Student Edition

USA TODAY

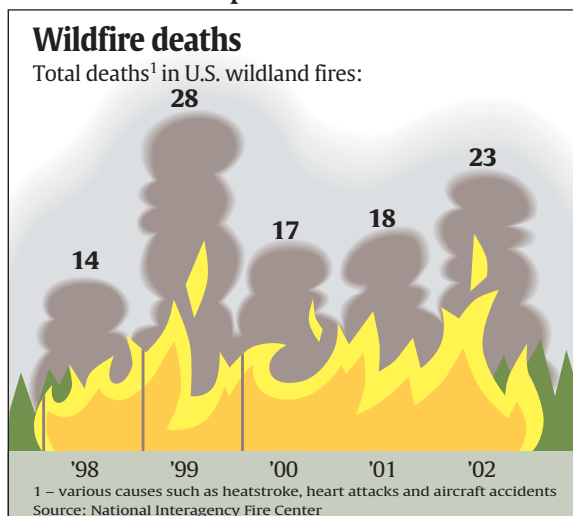NO. 1 IN THE USA

Wildfire deaths

USA TODAY Snapshots®

Wildfire deaths

Total deaths[1] in U.S. wildland fires:

28

23

14

17

18

'98   '99   '00   '01   '02

1 – various causes such as heatstroke, heart attacks and aircraft accidents
Source: National Interagency Fire Center

By Sam Ward, USA TODAY

Focus Questions:

- How many deaths are caused by wildfires each year?

- Will a linear model predict the number of deaths caused by wildfires in a year?

- How can the affect of an outlier on an equation be minimized?

Activity Overview:

Wildfires devastate millions of acres a year and cost millions of dollars in lost lumber, housing and suppression costs. However, the most alarming figure is the number of fatalities associated with wildfires. The USA TODAY Snapshot "Wildfire deaths" displays the number of fatalities for the five years spanning 1998 through 2002. You will use this data to determine a linear model. You will examine the affect an outlier has on the model and compare methods to determine the best model.

This activity was created for use with Texas Instruments handheld technology.

Wildfire deaths

Procedure:

Step 1
Complete the chart with the data from the USA TODAY Snapshot. Your x-values will be the number of years since 1995. The first line has been completed for you.

Year	# of Years Since '95	# of Fatalities
1997	2	10
1998		
1999		
2000		
2001		
2002		

Step 2
Enter your x-values in the List Editor of your handheld in L1. Enter your y-value in L2. Set up a scatter plot on your handheld. Sketch your graph on the assessment sheet. Remember to label your axes.

Step 3
Run a linear regression on the data and store the equation in Y1. Note the equation, r and r2 values on the assessment sheet. Push the graph key. Using a colored pencil, add the line to your sketch. Round all answers to the nearest thousandths place.

Step 4
Retype the values in L3 and L4 leaving out the outlier. Run a linear regression on the adjusted data and store the equation in Y2. Note the equation r and r2 values on the assessment sheet. Push the graph key. Using a different colored pencil, add the line to your sketch. Round all answers to the nearest thousandths place.

Step 5
Turn off Y1 and Y2, but keep them in case you need to re-examine these graphs.

Step 6
Sketch the scatter plot again. Find a linear model for the original data in L1 and L2 using the median-median method on your handheld and store the equation in Y3. Note the equation on the assessment sheet. Push the graph key to view your plot again. Using a colored pencil, add the line to your sketch. Round the equation values to the nearest thousandth's place.

Step 7
Find a linear model for the adjusted data in L3 and L4 using the median-median method on your handheld and store the equation in Y4. Note the equation on the assessment sheet. Push the graph key to view your plot again. Using a different colored pencil, add the line to your sketch. Round the equation values to the nearest thousandth's place.
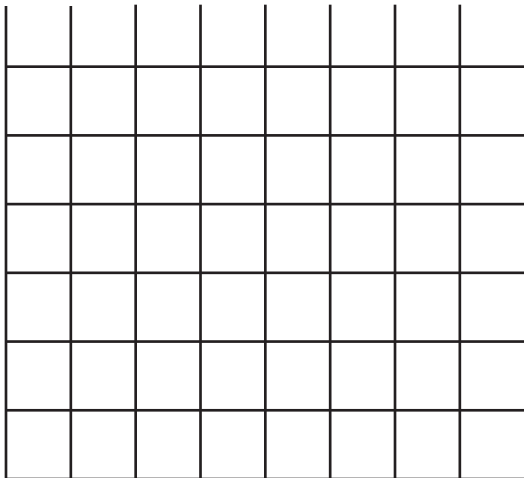
Data Source:

National Interagency Fire Center

Materials:

- TI-83 Plus family or TI-84 Plus family
- Colored pencils
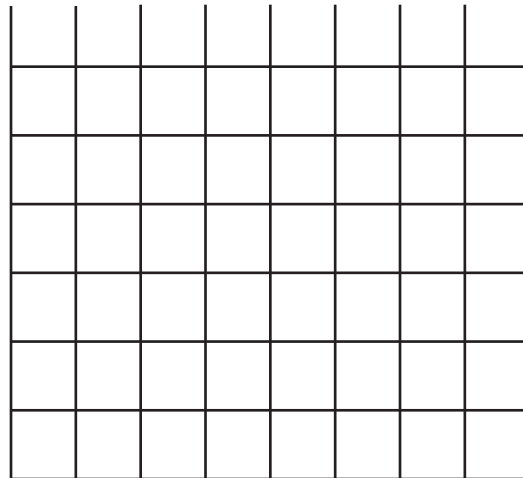- Straight edge

Assessment and Evaluation:

Linear Regression   **Median-Median**

Y1=_____   r = _____ r^2 =_____   Y3 =_____

Y2=_____   r = _____ r^2 =_____   Y4 =_____

Q. Using the equations from the linear regression, which equation best fits the model? List at least two reasons and be specific.
A.

Q. What is the difference in the slope of the two linear regressions? The y-intercept?
A.

Q. What is the difference in the slope of the two median-median equations? The y-intercept?
A.

Q. Which linear regression equation is closer to the median-median equation?
A.

Q. What is the method least affected by the outlier?
A.