#### THE NATION'S NEWSPAPER



# Humidity makes air feel even hotter



## Activity Overview:

The USA TODAY Infograph "Humidity makes the air feel even hotter" shows the relationship between humidity, air temperature and the heat index. The heat index (HI) is a measure used to describe how humidity and temperature interact to affect the way you feel on a hot day. You will create two scatter plots and determine the model for each scatter plot. Then you will describe the behavior of the dependent variable for each model as the independent variable increases. You will use the models to predict (interpolate) the heat index values for a given relative humidity at different temperatures.

### **Focus Questions:**

- Determine the models that would best represent the graphs of air temperature vs. heat index for 5% and 25% relative humidity.
- What do your models reveal about the behavior of the heat index as air temperature increases?
- What is the air temperature when the graph of each model would enter the Extreme Caution category?

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

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### **Procedure:**

### Activity 1

Determine the models that would best represent the graphs of air temperature vs. heat index for 5% and 25% relative humidity.

### Step 1

Enter the air temperatures in L1 shown in the USA TODAY Infograph "Humidity makes air feel even hotter" and the corresponding heat index values for the air temperatures in L2 for 5% relative humidity.

### Step 2

Enter the air temperatures in L3 shown in the USA TODAY Infograph "Humidity makes air feel even hotter" and the corresponding heat index values for the air temperatures in L4 for 25% relative humidity.

#### Step 3

Create two scatter plots, one plot for L1 and L2 and the other for L3 and L4.

#### Step 4

Use the regression capabilities of the calculator to find the best fit model for each scatter plot found in Step 3. Include the value for the correlation coefficient for each model.

Model for L1 and L2 \_\_\_\_\_ r<sup>2</sup>=\_\_\_\_\_

Model for L3 and L4\_\_\_\_\_ r<sup>2</sup>=\_\_\_\_\_

## Activity 2

What do your models reveal about the behavior of the heat index as air temperature increases?

#### Step 1

Look at the graph of L1 and L2 and answer the question about the behavior of heat index as air temperature increases.

#### Step 2

Look at the graph of L3 and L4 and answer the same question.



### **Data Source:**

National Oceanic and Atmospheric Administration

### Materials:

• TI-83 Plus family or TI-84 Plus family

### Additional Resources:

National Weather Service
www.crh.noaa.gov/pub/heat.htm



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### Activity 3

What is the air temperature when the graph of each model would enter the Extreme Caution category?

### Step 1

Record the low value for the Extreme Caution category found in the USA TODAY Infograph "Humidity makes air feel even hotter."

### Step 2

Use your regression model for L1 and L2 to predict the air temperature when this model would enter the Extreme Caution category.

#### Step 3

Use your regression model for L3 and L4 to predict the air temperature when this model would enter the Extreme Caution category.



### Student notes: