

# LINEAR REGRESSION WORKSHEET #3



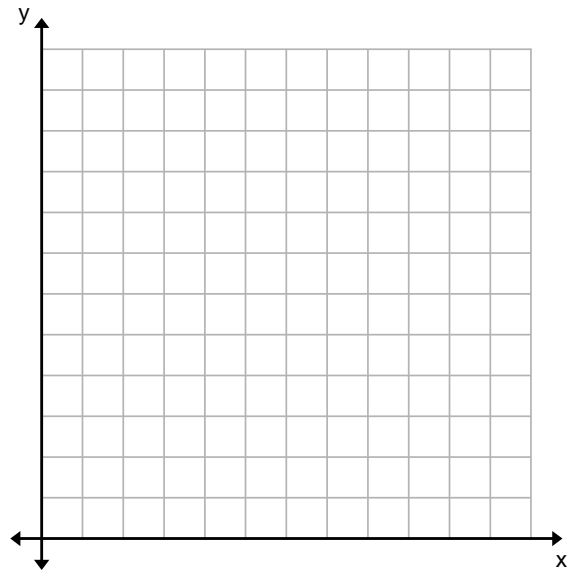
Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Is there a **causal relationship** in the following situations? If there is, describe the direction of the association.

1. The depth of a snowfall and the amount of time spent clearing the driveway
2. The number of cavities and the size of an elementary student's vocabulary
3. The number of hours a student spends playing video games a day and a student's GPA.
4. The following table shows the amount of garbage that was produced in the US each year between 2002 and 2010 (as reported by the EPA). Note that the years are reported as years since the year 2000.

$t$ , years since 2000	2	3	4	5	6	7	8	9	10
$G$ , million tons	239	242	249	254	251	255	251	244	250

a. Draw a scatterplot that shows this data.



b. Predict how much garbage will be produced in the year 2012.

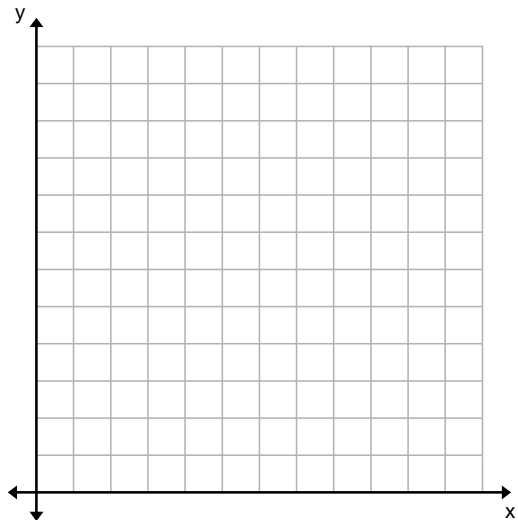
c. Find the correlation coefficient,  $r$ , and interpret it in the context of this problem.

d. Interpret the slope and y-intercept of the linear model in the context of this problem.

5. The availability of leaded gasoline in the state of Nevada is decreasing, as shown in the accompanying table.

<b>Number of years since 1990</b>	<b>4</b>	<b>5</b>	<b>12</b>	<b>16</b>	<b>20</b>
<b>Gallons Available (thousands)</b>	<b>150</b>	<b>124</b>	<b>104</b>	<b>76</b>	<b>50</b>

a. Draw a scatterplot of the data below.



b. Find the equation for the line of best fit.

c. Find the correlation coefficient and interpret it.

d. Using your model, determine the number of gallons of leaded gasoline that was available in the year 2000.

e. Interpret the slope and y-intercept in the context of the problem.

f. Sketch the residual plot at the right. Use the plot to discuss whether a linear model is appropriate for this data.

