Dear Parents
Below you will find a list of concepts that your child will use and understand while completing Unit 6 Linear Functions. Also included are references, vocabulary and examples that will help you assist your child at home.

Concepts Students will Use and Understand
- identify the rate of change and the initial value from tables, graphs, equations, or verbal descriptions
- write a model for a linear function
- sketch a graph when given a verbal description of a situation
- analyze scatter plots
- informally develop a line of best fit
- use bivariate data to create graphs and linear models
- recognize patterns and interpret bivariate data

Vocabulary
- **Model**: A mathematical representation of a process, device, or concept by means of a number of variables.
- **Interpret**: To establish or explain the meaning or significance of something.
- **Initial Value**: $y$-intercept.
- **Qualitative Variables**: A variable whose values are not numerical. Examples include gender (male, female), paint color (red, black, blue), type of bird (cardinal, blue bird, owl), and etc.
- **Linear**: A relationship or function that can be represented by a straight line.
- **Non-linear**: A relationship which does not create a straight line.
- **Slope**: The measure of steepness of a line.
- **Rate of Change**: The ratio of the change in the output value and change in the input value of a function.
- **Bivariate Data**: Two different response variables that are from the same population. This website has a good powerpoint (the 2nd one) that may help with the explanation.
- **Quantitative Variables**: A variable whose values are numerical. Examples include height, temperature, weight, grades, and etc.
- **Scatter Plot**: The graph of a collection of ordered pairs that allows an exploration of the relationship between the points.
- **Line of Best Fit**: A straight line drawn through the center of a group of data points plotted on a scatter plot.
- **Clustering**: The partitioning of a data set into subsets (clusters), so that the data in each subset (ideally) share some common trait - often similarity or proximity for some defined distance measure.
- **Outlier**: An element of a data set that distinctly stands out from the rest of the data.
Math 8 Unit 6 Practice Problems

Formulas

Slope \( (m) \)
\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]

Slope-Intercept Form
\[ y = mx + b \]

Y-intercept \((b); (0,b)\)

Example 1
The table shows the balance of a bank account on different days of the month. Find the rate of change during each time interval.

<table>
<thead>
<tr>
<th>Day</th>
<th>Balance ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>550</td>
</tr>
<tr>
<td>6</td>
<td>285</td>
</tr>
<tr>
<td>16</td>
<td>210</td>
</tr>
<tr>
<td>22</td>
<td>210</td>
</tr>
<tr>
<td>30</td>
<td>175</td>
</tr>
</tbody>
</table>

Example 2
Megan rolls a number cube and tosses a coin 200 times as part of an experiment. From her experiment, she records that a five was rolled 37 times and the coin landed on tails 107 times. On 88 occasions, neither a five was rolled nor did the coin land on heads. Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>Five</th>
<th>Not a Five</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>163</td>
<td>200</td>
</tr>
</tbody>
</table>

Answer Key

Example 1
Rate of changes: (results in a non-linear graph)
Day 1-6 = -53
Day 6-16 = -7.5
Day 16-22 = 0
Day 22-30 = -4.375

Example 2