Modeling Project

Mr. Zavala currently weights 230 pounds. He wants to start a diet and exercise plan to reach his ideal weight of 190 pounds. Please help Mr. Zavala in reaching his goal by creating an optimum diet and exercise plan. How many months will it take him to reach his desired weight?

Step 1: Gather Data about Weight loss, and select a diet & exercise plan (40 Possible Points)

- Research diet and exercise plans
- Gather data about weigh loss
  - How many calories it takes to gain/loss a pound?
  - On average how many calories does the body burn naturally?
- What exercise routines burn the most calories

Step 2: Create a chart/graph that maps our Mr. Zavala's progress (20 Possible Points)

Step 3: Find a function that models Mr. Zavala's weight loss (20 Possible Points)

- This step will be accomplished with the help of a graphing calculator (Mr. Zavala or Ms. Lopez will guide you with this)
  - Select Stat then edit and input your data (table of values, L1=input and L2=output)
  - Select Stat
  - Mover curser to the right, to CALC
  - Scroll down and select the type of regression (Linear, Quadratic, Cubic…)

Step 4: Using your data and function answer the following questions: (60 Possible Points)

1. How long did it take Mr. Zavala to reach his desired weight?
2. If he continues with your diet and exercise plan what would be his weight a year after he reached his goal? What about in two years?
3. What would happen if Mr. Zavala stops using your diet and exercise plan? How long will it take him to go back to his starting weight? Under what conditions would he reached 330 pounds and how long will lit take him to reach this weight?

Step 5: Create a presentation about your findings and a summary of your research processes. (30 Possible Points) (You can create a power-point presentation, or charts and posters)

- Provide a brief explanation of the diet and exercise routines you selected and why.
- In addition include, how many calories it takes to gain/lose a pound? On average how many calories does the body burn naturally?
  What exercise routines burn the most calories?

Step 6: Present your findings (30 Possible Points)

Total Possible Points 200.

Important Dates

1. On Wednesday 5/01/13 each group will to meet with Mr. Zavala and Ms. Lopez to discuss the groups progress
2. On Friday 5/03/13 rough drafts are presented to Mr. Zavala and Ms. Lopez
3. The project is due on Monday May 6th and presentations start.

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The project should take approximate 5-7 periods if research is conducted during class (For large classes more time might be needed for the student presentations).

The project could be implemented when covering the following standards:

Common Core Standards

- CCSS.Math.Content.HSF-BF.A.1 Write a function that describes a relationship between two quantities.★
  - CCSS.Math.Content.HSF-BF.A.1a Determine an explicit expression, a recursive process, or steps for calculation from a context.
  - CCSS.Math.Content.HSF-BF.A.1b Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model*.
  - CCSS.Math.Content.HSF-BF.A.1c (+) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time*.

CCSS.Math.Practice.MP4 Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

California Standards

6.0*: Students graph a linear equation and compute the x- and y- intercepts (e.g., graph $2x + 6y = 4$).

7.0*: Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations using the point-slope formula.