**Functions to Model Relationships: “I Have a Dream.”**

Name:

Date:

Instructions: The mathematics of real life is often complicated. For this assignment please evaluate the following graphs “Life expectancy at birth, in years” and “Percent of population living below the federal poverty line” in your table groups of 4. Let’s use our math vocabulary!

1. What story do the graphs tell about growth of social equality?
2. What are the quantities of each of the variables being measured (x value and y value)? Can you describe the overall trend in the data? Is the trend increasing or decreasing? Is the structure linear and non-linear?
3. Can you create a formula that works approximately (y=mx+b)? Can you calculate the rate of change (slope) for each equation you constructed (remember rise over run)?
4. Use the rate of change to explain how living, economic, or social conditions measurably changed from decade to decade.

Exit Ticket: Please write down one math concept the learned or really understood today and how you can help create equality among the middle school.

**Possible Responses: Answer Key**

1. Over time, the social equality of whites has stayed relatively the same between 1960 and 2010. However, for African Americans, their social equality has changed dramatically because in 1960 the percent of African Americans living below the poverty was about 55%, but in 2010 it was only about 28%.
2. The x-axis is measuring time in years from 1960 to 2010 and the y-axis measures the percent of African Americans and whites living below the poverty line from 0%-55.1%. The overall trend in the data shows that the poverty levels of whites have remained relatively unchanged, but the poverty level of African Americans continues to drop. The trend for whites is steady whereas the trend for African Americans is decreasing. Both trends are moderately linear.
3. African American’s: y = -1.8545x + 55.1 White American’s: y = -10x + 18.1
4. The rate of change from 1960-70 was much higher than that of the other decades.  After those first ten years the rate of change dropped noticeably, and has since been steadily increasing, until the past decade of which it has been slightly increasing again.

**Assessment Rubric:**

1. Student identifies variables. On-Target - 3 Developing - 1 Missing - 0
2. Equation approximately matches graph data. On-Target - 3 Developing - 1 Missing - 0
3. Explanations are mathematically correct. On-Target - 3 Developing - 1 Missing - 0
4. Explanation refers to equation, or graph. On-Target - 3 Developing - 1 Missing - 0
5. Students justify how and why their equation, On-Target - 3 Developing - 1 Missing - 0  
   rate of change (slope) accurately reflects the   
   graphs provided.

**Reference:**

Inspiration and some materials from:

A Half-Century After the March on Washington, Would King Be Satisfied? (n.d.).

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Math at the Core: Middle School. (n.d.). Retrieved May 06, 2016, from  
 <http://www.pbslearningmedia.org/collection/mathcore/?topic_id=856>