

Usain Bolt Project --- aka Rate of Speed Project



Overview: If you choose this project you will have to

1. do four time trials – covering varying distances
2. calculate the rate of each trial
3. graph your information
4. predict what your time would be for twice the longest distance and explain how you came up with that number
5. ascertain what determines the slope of a line



Directions:

The trials:

1. find a course that is approximately 200 yds (2 football fields) long
2. choose how you would like to complete this course – walking, running, skipping, or walking backwards – you need to use the same method of completing the course for all four trials.
3. Trial 1.
 - a. Complete $\frac{1}{4}$ of the course (approx. 50 yds), just once without stopping, timing yourself from beginning to end
 - b. Record your time on the data sheet on the next page
4. Trial 2.
 - a. Complete $\frac{1}{2}$ of the course (approx 100 yds) , just once without stopping, timing yourself from beginning to end
 - b. Record your time on the data sheet on the next page
5. Trial 3
 - a. Complete $\frac{3}{4}$ of the course (approx 150 yds), just once without stopping, timing yourself from beginning to end
 - b. Record your time on the data sheet on the next page
6. Trial 4
 - a. Complete the entire course (200 yds), just once without stopping, timing yourself from beginning to end
 - b. Record your time on the data sheet on the next page

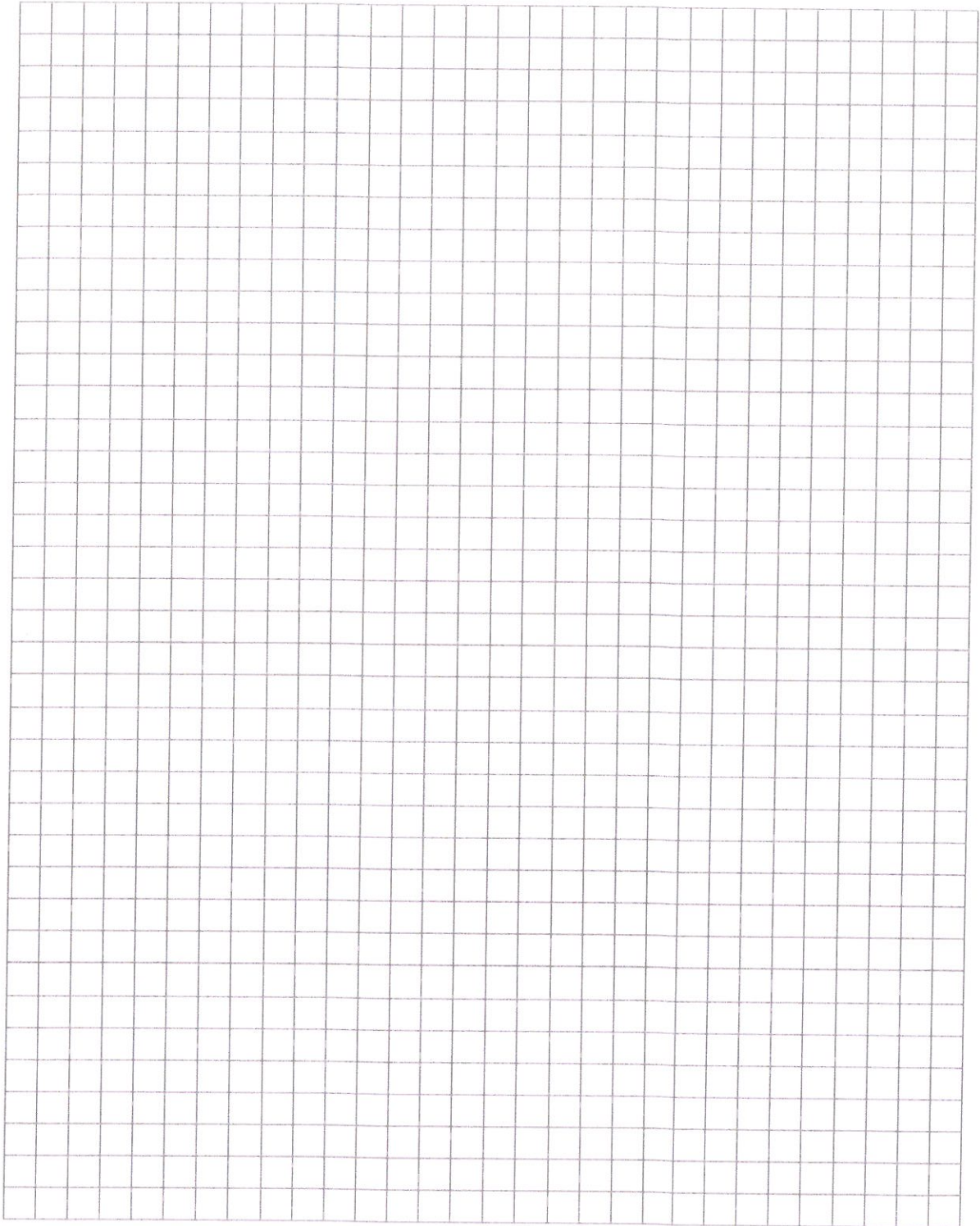
Data Sheet:

1. Fill in the data sheet below as you complete the trials
2. Compute the rate for each trial ($r = d/t$)

Trial Number	Distance	Time	Rate in yds/ seconds

Graph:

1. Graph the information for each trial on the coordinate plane on the next page
2. Draw an x-axis and y-axis (how many quadrants will you need? Hint: did you have any negative times or negative distances?)
3. Clearly label the intervals on each axis – making sure that
 - a. There are equal increments on the y-axis
 - b. There are equal increments on the x-axis
 - c. All data points can be displayed on the graph
4. Use distance on the x-axis – independent variable
5. Use time on the y-axis – dependent variable
6. Make sure you give the graph a name and that you label each axis



1 Block = $\frac{1}{4}$ "

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Prediction:

1. Compare the rates for each of your trials - did the rates increase, decrease, or stay the same as the distance increased?
2. Based on that answer, would you expect the rate for 300 yd. to increase, decrease, or stay the same?
3. What do you predict the rate for 300 yd. will be? _____
4. Based on that rate – how much time will it take to travel the 300 yd. course? _____
(hint: $t = d/r$)
5. Plot this prediction on the graph
6. I chose this rate because (be as specific as you can – using calculations if possible)

Challenge I: Optional for incoming 7th; Mandatory for incoming 8th

1. Find the average change in the rate (commonly called the first derivation) by finding the change in the rate (difference) between each segment of the line and averaging these rates. _____
2. Use this average to predict the rate for a 300 yd course. _____
3. How did this rate compare with the one that you 'guesstimated' in the exercise above?

Challenge II: Optional for all

1. Draw a line of best fit for the data points on your line graph.
2. Write the equation for the line of best fit. _____

Deliverables: (the work you need to turn in)

1. Data Sheet – p. 2
2. Graph – p.3
3. Predictions and challenges – p. 4

Please staple all the pages together and make sure your name is on the top sheet.

If you have any questions you can email Mrs. Breault at jbreault@stmichael.net

Hope you had fun!