

Unit Title: Reaction time**Grade Level: (example: 9, 10, 11, 12 or 7-8) 8th grade****Subject Area: (example: Science, Physics; English, Short Stories) Math****Duration/Length/Number of class periods: (example: 5 class periods) 4, 82 minute class periods****Description:**

Students will be able to collect and organize data. They will use graphing technology to find constant rates of change and describe those changes using an equation, verbal description, and tables. Students will use the technology to predict outside of the given data set.

Established Goals (National, State, Local):

8.4.1.1 Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit and determine an equation for the line. Use appropriate titles, labels and units. Know how to use graphing technology to display scatterplots and corresponding lines of best fit.

8.4.1.2 Use a line of best fit to make statements about approximate rate of change and to make predictions about values not in the original data set. For example: Given a scatterplot relating student heights to shoe sizes, predict the shoe size of a 5'4" student, even if the data does not contain information for a student of that height.

8 Data Analysis & Probability Interpret data using scatterplots and approximate lines of best fit. Use lines of best fit to draw conclusions about data.

8.4.1.3 Assess the reasonableness of predictions using scatterplots by interpreting them in the original context. For example: A set of data may show that the number of women in the U.S. Senate is growing at a certain rate each election cycle. Is it reasonable to use this trend to predict the year in which the Senate will eventually include 1000 female Senators?

What Enduring Understandings are desired?

Relationships exist between real world quantities and they may be modeled and predicted with mathematics. Collecting data and analyzing to understand a topic is an important process to problem solving.

What **Essential Questions** will be considered?

What relationships can be modeled with a linear function?

Is there a pattern in the relationship graphed?

How can I use technology to solve and predict data outside the dataset?

Students will know / be able to:

I can collect, display, and interpret data using scatterplots. (8.4.1.1)

I can analyze the reasonableness of a line of best fit and use it to make predictions. (8.4.1.2, 8.4.1.3)

I can write an equation for a line of best fit and analyze its reasonableness. (8.4.1.2, 8.4.1.3)

Description <i>Units must include at least one of each formative, summative, introductory activity and learning activity. Check the appropriate box; one per row.</i>	Fo m a t i v e	Su m m a t i v e	Intr odu ctor y Acti vity	Lea rning Acti vity	Stu den t Tec hno log y Use d	Teac her Tech nolo gy Use d	ISTE Stan dard s
Collect Classroom Data- Have students collect their reaction time in a table Let's Play Ball- Take a look at your reaction time. https://www.exploratorium.edu/baseball/activities/fastball-reaction.html When data is collected, students will go through the reaction time module online. http://www.scootle.edu.au/ec/viewing/L5905/index.html			X	X	X		2, 4
Introduction to scatterplots https://www.explorelearning.com/index.cfm?method=cResource.dspView&ResourceID=308 Worksheet on Lines of Best Fit			X	X	X	X	2,4
Students will create a scatterplot of their individual data and the number of trials. As a group they will find their average reaction time and have a discussion about why that time is different.	X						

Reaction time http://www.nanosonic.com/wp-content/uploads/2017/07/Module-1_Crash-Prevention_Lesson-1-Physics-and-Reaction-Time_LP_MS.pdf As drivers, we depend on multiple inputs to drive safely in ever-changing conditions. How we respond to those inputs is important to our own safety as well as to the safety of other drivers. Through discussion, analysis, hands-on experiments and group conclusions, students will be able to understand that their own reaction times are not instantaneous and practical reaction time limits affect how driving and driving safety can be affected.			X	X			
Have students read the following article and comment on Padlet https://www.edgarsnyder.com/car-accident/cause-of-accident/cell-phone/cell-phone-statistics.html	X		X	X	X	X	2,3
Invite the police liaison officer into the classroom to discuss statistics of car accidents in local town or county.		X	X				
Brainstorm data that can be collected. Post ideas on Padlet. In pairs, create a question that could be modeled by a linear function. Collect data and test if the data would be linear. Include a best fit line, write an equation and use to predict data outside of the data set. Use graphing calculator or DESMOS		X					

Materials, tools and resources - Listed above and extension activity https://docs.google.com/document/d/1F4urcN-ivj-xXUr933ZBamZL6oFOktSJ1Hx5YPJqy9E/edit?usp=sharing
Unit Plan Author (name, school and optional email address or hyperlink to teacher's web page) Erin Klecker-eklecker@isd761.org
Additional credit given to