Burning Volumes?

An analysis of how the volume of various jars impacts the burning time of candles. Data collected will be used to continue the discussion of modeling, line fitting and linear regression.

Mathematical Concepts Explored	Technology Used	Commands/Functions Utilized
• Data Collection • Data Analysis • Graphing • Line of Best Fit • Reasoning	Graphing Calculator TI-83 or TI-83 Plus or Silver Edition	• STAT/Edit • STAT/CALC/ 4:LinReg • Y = VARS • STATPLOT • ZOOM • GRAPH

California Mathematics Content Standards Addressed by this Activity

5th grade
- Algebra and Functions – Use variables in simple expressions
- Algebra and Functions 1.4 – Identify and graph ordered pairs
- Algebra and Functions 1.5 – Graph simple equations
- Statistics and Data Analysis 1.0 – Display, analyze, compare, and interpret data sets

6th grade
- Algebra and Functions 1.0 – Write, solve, and graph simple linear equations.
- Algebra and Functions 2.0 – Analyze and use tables
- Measurement and Geometry 1.0 - Deepen understanding of measurement.
- Statistics and Data Analysis 1.0 – Compute and analyze data sets

7th grade
- Algebra and Functions 3.3 – Graph linear functions
- Algebra and Functions 4.0 – Solve linear equations
- Statistics and Data Analysis – Collect, organize, and represent data sets and identify relationships.

Algebra

- Standards 4 – Simplifying and solving equations
- Standard 5 – Multistep problems including word problems
- Standard 6, 7 – Graphing
- Standard 15 – Rate problems
- Standards 16, 17, 18 – Functions
- Standard 24, 25 – Hypothesis and Conclusion, Validity of Argument

Preceding Activity(ies)

Activity Agenda, Teacher Notes and Points for Discussion

	Teacher will…	**Student will…**
1.	Explain the activity *To predict when a candle will burn out for the size of a jar.*	Gather data for a number of known size jars *or* students will record data gathered in the teacher demo.
2.	Monitor data gathering, clarify directions, and answer questions.	Gather data in the classroom in groups of four. Take three time measurements for each jar and average the time. Graph the points then draw a line of best fit using a ruler.
3.	Use overhead and/or graphing calculator poster to review how to find the line of best fit and determine it's accuracy.	Use a graphing calculator to derive an equation of the line of best fit. Adjust TBLSET to accommodate data.
4.	Tell students the size of the unknown jar,	Make a prediction based on their hand graph and based on their equation.
5.	Get predictions from groups – then run the experiment.	Determine the accuracy of the predictions.
6.	Discuss accuracy of predictions and any factors which may have impacted the results (airtight seal, displacement of air by the candle, accuracy of size of the jar etc.)	Process and reflect on activity.

Follow-Up Activity(ies)

Possible Extensions/Changes to this Activity