

# MP1d-Equations of Linear Functions

Content Area: **Math**  
Course(s): **Math 8 Algebra 1 Honors**  
Time Period: **Marking Period 1**  
Length: **MP1**  
Status: **Published**

## Essential Questions

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Why is math used to model real-world situations?

## Big Ideas

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- Create equations that describe numbers or relationships.
- Understand the concept of a function and use function notation.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities.
- Build new functions from existing functions.
- Construct and compare linear, quadratic, and exponential models and solve problems.
- Interpret expressions for functions in terms of the situation they model.
- Summarize, represent, and interpret data on two categorical and quantitative variables.
- Interpret linear models.

## Technology Integration

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8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results.

8.1.8.A.5 Create a database query, sort and create a report and describe the process, and explain the report results.

Activity:

The Algebra College Slope Project encourages students to learn about college choices and decisions. Students have to opportunity to research colleges and universities, and select one based on possible majors they would be interested in, as well as a budget. Students then research possible high school jobs in an effort to earn money to use for college tuition. Students create electronic descriptions of their research, spreadsheets on the computer, and develop linear functions electronically.

## **Enduring Understandings**

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### **Creating Equations**

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

### **Interpreting Functions**

F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.

### **Building Functions**

F.BF.4a Solve an equation of the form  $f(x) = c$  for a simple function  $f$  that has an inverse and write an expression for the inverse. For example,  $f(x) = 2x^3$  or  $f(x) = (x+1)/(x-1)$  for  $x \neq 1$ .

### **Linear, Quadratic, & Exponential Models**

F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

### **Interpreting Categorical & Quantitative Data**

S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.

S.ID.7 [M] Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

S.ID.8 [M] Compute (using technology) and interpret the correlation coefficient of a linear fit.

S.ID.9 [M] Distinguish between correlation and causation.

## **Mathematical Practices Focus**

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1. Make sense of problems and persevere in solving them. Lessons 0-1, 1-8, 2-4, 3-4, 4-5, 5-4, 6-4, 7-5, 8-8, 9-

3, 10-5, 11-1, 12-4

2. Reason abstractly and quantitatively. Lessons 1-3, 2-1, 3-3, 4-1, 5-1, 6-5, 7-2, 8-5, 9-1, 10-3, 11-8, 12-2

3. Construct viable arguments and critique the reasoning of others. Lessons 1-3, 2-5, 3-5, 4-2, 5-5, 6-1, 7-4, 8-1, 9-2, 10-4, 11-2, 12-1

4. Model with mathematics. Lessons 1-1, 2-9, 3-2, 4-5, 5-1, 6-5, 7-6, 8-7, 9-7, 10-4, 11-7, 12-5

5. Use appropriate tools strategically. Lessons 1-7, 2-4, 3-2, 4-4, 5-6, 6-1, 7-5, 8-2, 9-6, 10-6, 11-8, 12-3

6. Attend to precision. Lessons 1-3, 2-8, 3-4, 4-2, 5-2, 6-6, 7-4, 8-9, 9-5, 10-1, 11-6, 12-2

7. Look for and make use of structure. Lessons 1-2, 2-5, 3-6, 4-1, 5-5, 6-3, 7-7, 8-6, 9-6, 10-2, 11-2, 12-8

8. Look for and express regularity in repeated reasoning. Lessons 1-4, 2-7, 3-1, 4-1, 5-4, 6-1, 7-1, 8-4, 9-3, 10-2, 11-5, 12-6