MP1b-Linear Equations

Content Area: **Math**
Course(s): **Algebra 1 Accelerated**
Time Period: **Marking Period 1**
Length: **enVision Chapter 2, 11 days**
Status: **Published**

Essential Questions

- Why is it useful to have different forms of linear equations?

Big Ideas

- Write and graph linear functions.
- Identify and interpret the components of linear graphs, including slope and intercepts.
- Slope-intercept and point-slope forms.
- Parallel and perpendicular lines.

CSDT Technology Integration

8.1.8.AP.9 Document programs in order to make them easier to follow, test, and debug.

8.1.2.DA.4 Make predictions based on data using charts or graphs.

8.1.8.AP.2 Create clearly named variables that represent different data types and perform operations on their values.

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.

Cross-Curricular Integration

Integration Area: Language Arts

LA.8.W.8.2.A Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

LA.8.W.8.2.B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

LA.8.W.8.2.C Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

LA.8.W.8.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

LA.8.W.8.2.E Establish and maintain a formal style/academic style, approach, and form.

LA.8.W.8.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented.

LA.8.W.8.4 Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

LA.8.W.8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

LA.8.W.8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

LA.8.W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

LA.8.W.8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

LA.8.W.8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

LA.8.W.8.10 Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

A.REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Activity:

Slope/College/Savings project. Students will research various colleges and their tuition costs. Students will search for a job that will be able to assist in paying for a portion of the college tuition. Students will create

tables and linear representations of the collected data and then discuss the data in an explanatory essay.

Diversity Integration

Objective: Students will be able to use equations to figure out the factors that affect population growth.

Description of Activity: Students will explore the science of demography. They will explore how birth rate, death rate, emigration, and immigration affect population growth with a country of their heritage. Students will analyze how changes in these indicators affect resource sustainability and how resource availability affects population growth.

Enduring Understandings

Expressions and Equations

8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane, derive the equation y=mx for a line through the origin and the equation y=mx+b for a line intercepting the vertical axis at b.

8.EE.C.7a Solve linear equations in one variable with one solution, infinitely many solutions or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x=a, a=a or a=b results (where a and b are different numbers.)

8.EE.C.7b Solve linear equations in one variable. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Creating Equations

A.CED.A4 [M] Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

- Solving for a Variable

A.CED.A1 [M] Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

- Solving Absolute-Value Equations

A.CED.A2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

Interpret Linear Models

S.ID.C.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. 8. Compute (using technology) and interpret the correlation coefficient of a linear fit. 9. Distinguish between correlation and causation.

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

S.ID.C.9 Distinguish between correlation and causation.

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Pages 63

2. Reason abstractly and quantitatively. Pages 69, 76

3. Construct viable arguments and critique the reasoning of others. Pages 57, 63, 69

4. Model with mathematics. Pages 57, 69, 75

5. Use appropriate tools strategically.

6. Attend to precision. Pages 63, 76

7. Look for and make use of structure. Pages 57, 76

8. Look for and express regularity in repeated reasoning. Pages