Jan. BI Alg. I Unit 4: Writing Linear Functions

Content Area: **Math**
Course(s):
Time Period: **January**
Length: **6-8 Weeks**
Status: **Published**

Unit Overview

Writing Equations in Slope-Intercept Form

- Writing Equations in Point-Slope Form

- Writing Equations of Parallel & Perpendicular Lines

- Scatter Plots & Lines of Fit

- Analyzing Lines of Fit

- Arithmetic Sequences

- Piecewise Functions

Enduring Understandings

SWBAT:

- Write equations in slope-intercept form
- Use linear equations to solve real-life problems
- Write an equation of a line given its slope and a point on the line
- Write an equation of a line given two points on the line
- Use linear equations to solve real-life problems
- Identify and write equations of parallel lines
- Identify and write equations of perpendicular lines
- Use parallel and perpendicular lines to solve real-life problems
- Interpret scatter plots
- Identify correlations between data sets
- USe lines of fit to model data
- Use residuals to determine how well lines of fit model data
- Use technology to find lines of best fit
- Distinguish between correlation and causation
- Write the terms of arithmetic sequences
- Graph arithmetic sequences
- Write arithmetic sequences as functions
- Evaluate piecewise functions
- Graph and write piecewise functions
- Graph and write step functions
- Write absolute value functions

Essential Questions

- How can we use the slope intercept-form to write the equation of a line?
- How do we model real-life situations with a linear function?
- How can we use slope and any point on a line to write an equation of the line?
- How do we use a linear model to make predictions about a real-life situation?
- How can we write an equation of a line given two points on the line?
- How do we find a linear equation that approximates a set of data points?
- How can we determine whether there is a positive or negative correlation in a set of real-life data?
- How can we use the point-slope form to write an equation of a line?
- How do we use the point-slope form to model a real-life situation?
- How can we determine whether a linear model is appropriate?
- How do we use an arithmetic sequence to describe a pattern?
- How do we describe a function represented by more than one equation?

Instructional Strategies & Learning Activities

- Guided Practice
- Do Now
- Extra Practice & Puzzle Time (Resources)
- Scavenger Hunts
- Coloring Activities
- Task Cards (Around the World)
- Maze Activities
- Quizizz Online Assignments
- Kahoot! Online Games

Integration of Career Readiness, Life Literacies and Key Skills

WRK.9.2.8.CAP	Career Awareness and Planning
WRK.9.2.8.CAP.1	Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
WRK.9.2.8.CAP.2	Develop a plan that includes information about career areas of interest.
WRK.9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
WRK.9.2.8.CAP.4	Explain how an individual's online behavior (e.g., social networking, photo exchanges,

	video postings) may impact opportunities for employment or advancement.
WRK.9.2.8.CAP.10	Evaluate how careers have evolved regionally, nationally, and globally.
WRK.9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
TECH.9.4.8.CI.4	Explore the role of creativity and innovation in career pathways and industries.
TECH.9.4.8.CT	Critical Thinking and Problem-solving
TECH.9.4.8.DC.5	Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure.
TECH.9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.GCA	Global and Cultural Awareness
TECH.9.4.8.GCA.1	Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a).
TECH.9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
TECH.9.4.8.IML.1	Critically curate multiple resources to assess the credibility of sources when searching for information.
TECH.9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
TECH.9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.
TECH.9.4.8.IML.7	Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH. IPRET.8).
TECH.9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
	There are variety of resources available to help navigate the career planning process.
	An individual's strengths, lifestyle goals, choices, and interests affect employment and income.

Technology and Design Integration

CS.6-8.8.1.8.CS.4	Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
CS.6-8.8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
CS.6-8.8.1.8.DA.2	Explain the difference between how the computer stores data as bits and how the data is displayed.
CS.6-8.8.1.8.DA.3	Identify the appropriate tool to access data based on its file format.
CS.6-8.8.1.8.IC.1	Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
CS.6-8.8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.

CS.6-8.8.2.8.ITH.2	Compare how technologies have influenced society over time.

Interdisciplinary Connections

LA.W.8.1.A	Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
LA.W.8.1.B	Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
LA.W.8.1.D	Establish and maintain a formal style.
LA.W.8.1.E	Provide a concluding statement or section that follows from and supports the argument presented.
LA.RI.8	Reading Informational Text
LA.RI.8.1	Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
LA.RI.8.2	Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.
LA.RI.8.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
LA.RI.8.8	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.
LA.SL.8.1.C	Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.
LA.SL.8.1.D	Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.
- **Definitions of Differentiation Components**:
    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

Additional support for stuggling learners will be available.

Challenges will be offered to students requiring additional depth of knowledge.

Modifications & Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

IEP and 504 accommodations will be utilized.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

Additional Benchmarks used in this unit:

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

- Kahoot! Games
- Quizizz Games
- Homework
- Q & A
- Scavenger Hunts
- Coloring Activities
- Task Cards
- Partner Activities

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

- Chapter Tests
- Quizzes

Instructional Materials

1. Big Ideas Math: Algebra 1: A Common Core Curriculum
2. Quizizz
3. Kahoot
4. Scavenger Hunts
5. Task Cards
6. Coloring Activities
7. Resources Book
8. Scientific Calculator
9. Graphing Calculator

Standards

0x CCSS.Math.Content.HSA-CED.A.2 Create equations in two or more variables to

	represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
0x	CCSS.Math.Content.HSA-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
0x	CCSS.Math.Content.HSF-BF.A.1.a	Determine an explicit expression, a recursive process, or steps for calculation from a context.
0x	CCSS.Math.Content.HSF-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
0x	CCSS.Math.Content.HSF-IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
0x	CCSS.Math.Content.HSF-IF.C.7.b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
0x	CCSS.Math.Content.HSF-LE.A.1.b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
0x	CCSS.Math.Content.HSF-LE.A.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).
0x	CCSS.Math.Content.HSF-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.
0x	CCSS.Math.Content.HSS-ID.B.6.b	Informally assess the fit of a function by plotting and analyzing residuals.
0x	CCSS.Math.Content.HSS-ID.B.6.c	Fit a linear function for a scatter plot that suggests a linear association.
0x	CCSS.Math.Content.HSS-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term)

		of a linear model in the context of the data.
0x	CCSS.Math.Content.HSS-ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
0x	CCSS.Math.Content.HSS-ID.C.9	Distinguish between correlation and causation.