

Unit 1: Linear Functions

Algebra 1 Honors

14 Class Meetings

Revised October 2025

Essential Questions

- What does the slope of the line indicate about the line?
- What real-world information can you gain from an equation of a line?

Enduring Understandings with Unit Goals

EU 1: The slope of an equation describes the vertical change and horizontal change of a line between two points.

- Examine various relations and determine if they represent functions
- Determine the slope of a line in an equation and on a graph
- Calculate the slope from a table of values or between two points
- Interpret the average rate of change of a function over a specific interval

EU 2: The graph of a line can be represented using a linear equation.

- Represent a line using an equation and a graph.
- Create linear functions from real-world scenarios

EU 3: The relationship between two lines can be determined by comparing their slopes and y-intercepts

- Determine if a line is parallel or perpendicular to another line using their slopes and y-intercepts
- Create a linear function that is parallel or perpendicular to another linear function

Standards

Common Core State Standards:

- **HS.F.IF.B.6:** Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph.
- **HS.F.IF.C.7:** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- **HS.F.IF.B.4:** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
- **HS.F.IF.LE.A.1.B:** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- **HS.F.IF.LE.A.2:** Construct linear functions given a graph, a description of a relationship, or two input-output pairs.
- **HS.F.IF.LE.B.5:** Interpret the parameters in a linear function in terms of a context.
- **HS.A.CED.A.2:** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **HS.G.GPE.B.5:** Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Rate of Change and Slope

- Find the Slope of a Line Using the Rate of Change
- Find the Slope of a Line Using a Graph
- Find the Slope of a Line Using Points
- Vocabulary: slope, line, ordered pair, coordinate, x-axis, y-axis, rate, graph, coordinate plane, constant of proportionality, origin

2. Slope – Intercept Form

- Identify slope and y-intercept
- Graph a Linear Equation
- Vocabulary: slope, line, ordered pair, coordinate, x-axis, y-axis, rate, graph, coordinate plane, origin, constant of proportionality, x-intercept, y-intercept

3. Equations in Other Forms

- Identify Parts of an Equation in Point-Slope Form
- Rearrange Equations in Standard Form
- Graph Equations in All Forms
- Vocabulary: slope, line, ordered pair, coordinate, x-axis, y-axis, rate, graph, coordinate plane, coefficient, standard form, point-slope form, additive inverse, multiplicative inverse

4. Writing Equations

- Write an Equation in Slope-Intercept Form
- Write an Equation in Point-Slope Form
- Vocabulary: standard form, point-slope form, slope-intercept form, additive inverse, multiplicative inverse

5. Parallel and Perpendicular Lines

- Write an Equation of a Parallel Line
- Write an Equation of a Perpendicular Line
- Classify Lines
- Solve a Real-World Problem
- Vocabulary: slope, reciprocal, intersection, parallel lines, perpendicular lines, ninety-degree angle, straight line, 180-degree angle

Interdisciplinary Connection:

- Language Arts- Accountable Talk, Word Problems, and Writing CER/TWPS

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Daily Learning Objectives with *TWPS Activities*

Students will be able to...

- Examine various relations and determine if they represent functions and are linear or nonlinear
 - *TWPS – Why does the “vending machine” example not work if A9 goes to two separate snacks?*
- Determine the slope of a line given a graph and calculate slope using the slope formula
 - *TWPS – What error did the student make when determining the slope of the line? Explain.*
- Interpret rate of change in functions and calculate specific rates in specified intervals
 - *TWPS - Do all graphs have to count by 1's? If not, how does this change the way we calculate the slope?*
- Graph linear equations given the slope-intercept form of the equation
 - *TWPS - Which of the four linear equations does not belong with the rest? Explain.*
- Write and explain the equation of a line in slope-intercept form
 - *TWPS - How could you write instructions for writing a linear equation in slope-intercept form given a graph?*
- Graph and describe linear equations given in the point-slope form of the equation
 - *TWPS – Which of the following functions does not belong with the rest? Explain.*
- Write linear equations in point-slope form given a variety of characteristics
 - *TWPS – Describe the difference between a linear function in slope-intercept form and one in point-slope form.*
- Graph a linear function in standard form by calculating the x and y intercepts
 - *TWPS – What is the difference between an x-intercept and y-intercept?*
- Analyze whether lines are parallel, perpendicular, or neither
 - *TWPS – What characteristics make lines parallel? Perpendicular?*
- Create equations for parallel and perpendicular lines
 - *TWPS – What is the error in the student’s work when creating a linear equation in point-slope form?*

Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Independent problem-solving
- Collaborative problem-solving

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- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Cumulative Homework
- Math stations (rotations)

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

Assessments

FORMATIVE ASSESSMENTS:

- Accountable Talk Discussions
- Think-Write-Pair Share (TWPS)
- Claim-Evidence-Reasoning (CER)
- Daily Do Now: Spiral Review
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Cumulative Homework
- Performance Task – Designing the Perfect Football Plays
Performance Task Assessment Rubric

SUMMATIVE ASSESSMENTS:

- Pear Assessment Unit 1A Quiz (EU 1)
- Pear Assessment Unit 1B Quiz (EU 2)
- Pear Assessment Unit 1 Test (EU 1, EU 2, EU 3)
- FIAB: Proportional Relationships, Lines, and Linear Equations

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Unit Task

Performance Task Name: Designing the Perfect Football Plays

Description: Designing the Perfect Football Play measures students' understanding of linear functions through a real-world football context. Students examine relations to determine whether they represent functions and determine, calculate, and interpret slope as vertical and horizontal change and average rate of change from equations, graphs, tables, and pairs of points (EU 1). They represent lines using equations and graphs and create linear functions to model real-world scenarios such as player routes on the field (EU 2). Students also analyze the relationship between lines by comparing slopes and y-intercepts to determine and create parallel and perpendicular lines, explaining how these relationships affect movement and strategy in the play design (EU 3).

Evaluation: Performance Task Assessment Rubric

Unit Resources

- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Pear Assessment
- Khan Academy
- Quizizz
- Blooket
- Prodigy
- Interactive Notebooks
- Individual Whiteboards
- Online resources