HPISD Curriculum: Algebra I

Title	Estimated Duration	6 Weeks					
Unit 4: Graphing Linear Functions using Slope Intercept Form	2-3 weeks	1	**2**	3	4	5	6

Unit Overview

Students will use their skills of plotting points in a coordinate plane and learn to use tables, x- and y- intercepts, and the slope and y-intercept to graph linear equations and functions. They will interpret slope as a rate of change in real-world situations and explore how changing the slope and y-intercept changes to graph. Students will also learn about the linear parent function and family of lines. They will learn how to use function notation and solve functions for specific values.

Enduring Understandings

The student will understand that:	• Functions have three parts:
	  o a domain, which is the set of inputs to the function
	  o a range, which is the set of output
	  o a rule or statement of correspondence indicating how each input determines a unique output.
	• The domain and rule of correspondence determine the range.
	• Graphs are geometric representations of functions.
	• Function notation provides an efficient way to talk about functions, but notation is just that, an efficient way to talk about functions.
	• An inequality is a statement about the relative size of two or more values that are not equal.
	• Graphs can show infinite information.

Concepts	Guiding/Essential Questions
• change • relationships	• What is rise over run? • What is slope? • What is domain and range? • What are the slopes of vertical and horizontal lines? • How t-tables and graphs correspond to one another? • What is a family of lines? • How can a graphing calculator be used to find equations of lines using slopes and y-intercepts? • What is slope intercept form and what does each variable stand form and how does each change the graph? • How do you graph linear equations given in slope-intercept form? • What is function notation?

- How do you find the rate of change given a real-world situation?
- What does the slope in a real-world situation represent?
- How do you find the y-intercept given a real-world situation?
- What does the y-intercept in a real-world situation represent?
- How is a solution to an inequality expressed?
- How are graphs used to show infinite information?

Learning Targets

Students will represent linear functions algebraically, symbolically, verbally, and in tabular form. They will identify features of linear functions (slope, x- and y-intercepts), of functions presented in graphic, tabular, or symbolic form. Students will graph linear equations using t-charts, intercepts, slope-intercept form of a line, and point-slope form of a line. Students will understand how graphs of lines relate to the parent linear function and will indentify the domain and range of a graphed function.

Formative Assessments	Summative Assessments
homework, quizzes	test

TEKS: Readiness Standards	TEKS: Related Supporting Standards
A.2B Identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete.	**A.1A** Describe independent and dependent quantities in functional relationships.
A.2D Collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.	**A.1B** Gather and record data, and use data sets to determine functional relationships between quantities.
A.6B Interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs.	**A.2C** Interpret situations in terms of given graphs or creates situations that fit given graphs.
A.6F Interpret and predict the effects of changing slope and y-intercept in applied situations.	**A.5B** Determine the domain and range for linear functions in given situations.
A.1D Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and ~~inequalities~~.	**A.6A** Develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations.
A.7B Investigate methods for solving linear equations and ~~inequalities~~ using concrete models, graphs, and the properties of equality, select a method, and solve the equations and ~~inequalities~~.	**A.6D** Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y intercept.
	A.6E Determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations.
	A.1C Describe functional relationships for given problem situations and write equations or ~~inequalities~~ to answer questions arising from the situations.

A.3A Use symbols to represent unknowns and variables.

A.4B Use the commutative, associative, and distributive properties to simplify algebraic expressions.

A.7A Analyze situations involving linear functions and formulate linear equations or ~~inequalities~~ to solve problems.

A.7C Interpret and determine the reasonableness of solutions to linear equations and ~~inequalities~~.

Processes and Skills: What students should be able to DO	Facts: What students should KNOW
• Graph a line given an equation by creating a table. • Graph horizontal and vertical lines from equations. • Identify slopes of lines given equations. • Interpret what the x and y intercepts represent. • Graph x and y intercepts of a line. • Graph the linear parent function. • Interpret how the graph of the parent linear function changes when the slope or y-intercept is changed. • Use a graphing calculator to graph lines. • Graph a line in the form: y = mx + b • Write equations in y= mx + b. • Describe what a function is and will use function notation. • Solve functions and interpret what the solution means. • Find values of a function given x-values • Translates among various representations of linear functions	• Slope is a rate of change. • A table is another representation of an equation. • Changes in linear equations and function affect their graphs. • Linear relationships are characterized by a constant rate of change • Linear functions can be represented verbally, graphically, in tabular form, and symbolically • On a number line, the graph of an inequality in one variable is the set of points that represent all solutions of the inequality. • In a coordinate plane, the graph of an inequality in two variables is the set of points that represent all solutions of the inequality. • Multiplying or dividing by a negative number requires the inequality sign to be flipped. • A solid line or dot will be used for greater than or equal to OR less than or equal to. • A dashed or open dot will be used for greater than OR less than.

Topics

Quadrants, Domain and Range	Graphing Linear Equations using Intercepts	Function Composition
Slope and Rate of Change	Graphing Linear Equations using Slope Intercept Form	Graph Linear Functions
Graphing Linear Equations using T-table		Parent Function, Family of lines

Language of Instruction

Change in y over change in x	f(x)	Range
Coordinates	Horizontal Lines (HOY)	Slope intercept form y = mx +b
Dependent variable	Independent variable	Slope
Domain	Interpret graphs	Slope formula
Family of lines	Line	Substitution
Function	Ordered pairs	Table
Function Notation	Parent Function	Vertical Lines (VUX)
Functional relationship	Patterns	x-intercept
Function values	Rate of Change	y-intercept

State Assessment Connections

National Assessment Connections

Resources

McDougall Littell Chapter 4, Chapter 1 (Function Composition), and
Chapter 5.1 Calculator Activity (Family of Lines);
Teacher-made supplemental resources