8th Grade UNIT 11 OVERVIEW: Linear Functions – Equations of Lines

Unit Outcomes At the end of this unit, your student should be able to:	**Key Vocabulary** Terms to deepen the student's understanding
✓ Recognize slope-intercept form of a line and define the slope and y-intercept ✓ Graph a line given the equation, determine the slope of the line, and the y-intercept of the line ✓ Use effective strategies for writing linear equations from verbal, numerical, or graphical information ✓ Apply linear equations to real-world situations	✓ Horizontal ✓ Linear Equation ✓ Linear Function ✓ Linear Relationship ✓ Non-Linear Function ✓ Proportional Relationship ✓ Similar Triangles ✓ Slope ✓ Slope-Intercept Form ✓ Standard Form of an Linear Equation ✓ Unit Rate ✓ Vertical ✓ Vertical Line Test ✓ x-intercept ✓ x-intercept ✓ y-intercept ✓ y-value
Key Standards Addressed Connections to Common Core/NC Essential Standards	**Where This Unit Fits** Connections to prior and future learning
8.EE.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.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.F.3 - Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. 8.F.4 - Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or table of values.	**Coming into this unit, students should have a strong foundation in:** ✓ Computing unit rates ✓ Recognizing and representing proportional relationships between quantities ✓ Identifying the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships ✓ Representing proportional relationships with equations ✓ Identifying relations and functions by graphs, tables/ordered pairs, and equations ✓ Determining constant rate of change given a graph, table or equation. ✓ Explaining how slope effects the graph of an equation in $y = mx$ form ✓ Finding slope from a graph and from any two points **This unit builds to the following future skills and concepts:** ✓ Construct and interpret a linear function given a graph, verbal description, a table or a set of ordered pairs ✓ Compare two different linear functions represented in different forms ✓ Prove that linear functions grow by equal differences over equal intervals

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Additional Resources Materials to support understanding and enrichment	**"Learning Checks"** Questions Parents Can Use to Assess Understanding
✓ Teaching videos made by Wake County teachers ✓ WCPSS YouTube Channel – Math Playlist ✓ Slope-Intercept Form Overview ✓ Slope-Intercept Form Practice ✓ Graphing Linear Equations Video ✓ Graphing Linear Equations Practice ✓ Linear Equation Word Problem Video ✓ Linear Equation Word Problem Practice ✓ Standard Form of an Equation Video ✓ Standard Form of an Equation Practice ✓ Standard Form of an Equation Practice 2 ✓ Horizontal and Vertical Lines Video ✓ Horizontal and Vertical Lines Practice	✓ What is the difference between connecting the points on a graph with a straight line and connecting them with a dotted line? ✓ How do you determine the slope and y-intercept of a line? ✓ What is slope-intercept form? ✓ How can slope-intercept form be useful in creating a graph? ✓ What can you say about lines in slope intercept form just by looking at their equations? ✓ What affect does slope have on your graph? ✓ What affect does the y-intercept have on your graph? ✓ What does the equation of a vertical line look like? ✓ What does the equation of a horizontal line look like? ✓ How is the equation for a horizontal and vertical line different when written in slope-intercept form? ✓ What is unique about vertical lines compared to all other lines? Why is this? ✓ What are real world situations that use linear equations and graphs? ✓ What type of business could you create where you would use linear equations?

*** Please note**, the unit guides are a work in progress. If you have feedback or suggestions on improvement, please feel free to contact wakemiddle@wcpss.net.