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| **Willowridge High School Lesson Planning Guide** | | | | | |
| **Week of Lesson Plan: Week 4 (Nov 18 – Nov 22)** | **Teachers: Ms. Wu** | | **Assessments this week (if applicable):** | | |
| **Course/Class: Strategic Math** | **Unit:** *Slope intercept form / standard form / point slope form* | | **Main Concepts:**  *Slope intercept form / standard form / point slope form* | | |
|  | **Monday**  **Students will be able to determine the slope of a line from a graph by:**   1. **Selecting two points.** 2. **Identifying the coordinates.** 3. **Applying the slope formula** 4. **Interpreting the calculated slope.** | **Tuesday**  Students will be able to calculate the slope between two points by:  **1 identifying and labeling**  **2. substituting**  **3. calculating and simplifying**  **4. Interpreting** | **Wednesday 90-minute class**  **students will be able to find the slope of a line represented by a table of values by calculating the change in y-values over the change in x-values.** | **Thursday**  **90-minute class** | **Friday** |
| **TEKS (concept by day)** | A.3A determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including y = mx + b, Ax + By = C, and y - y1 = m (x - x1) | A.3A determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including y = mx + b, Ax + By = C, and y - y1 = m (x - x1) | A.3A determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including y = mx + b, Ax + By = C, and y - y1 = m (x - x1) | | Quiz |
| **Essential Question** | If we know two points on a line, how can you find the rate of change of the variables being graphed?? | How can we use coordinates to calculate the slope of a line? | How can we use a function table to find the slope and interpret its meaning? | |  |
| **Success Criteria** | Given a graph, students will be able to determine the slope of a line by the following steps:  **1)Choose Two Points on the Line**: Students will identify two clear points on the line. Ideally, these points should be where the line crosses the x- or y-axis (if applicable), where it intersects the corner of a square on the grid, or at points with whole-number coordinates.  2)**Identify Coordinates**: For each chosen point, students will determine the coordinates (x1, y1)( and (x2,y2)to use in the slope formula.  **3)Apply the Slope Formula**: Using the slope formula m=y2−y1/x2​−x1​ ​​, students will substitute the coordinates to calculate the slope.  **4)Interpret the Slope**: Students will then interpret the result to determine whether the slope is positive, negative, zero, or undefined based on the direction and steepness of the line. | Given two coordinates, students will be able to calculate the slope by:   1. Identifying the coordinates: Students will be able to label the two points as (x1, y1) and (x2, y2) 2. Substituting into the slope formula: Using the formula m=y2-y1/x2-x1, students will substitute the y- and x- values from the points. 3. Calculating the slope: Students will perform the arithmetic to find the slope, simplifying to get a single value, which may be positive, negative, zero, or undefined.   Interpreting the result: Based on the calculated slope, students will identify the type of the slope (positive, negative, zero or undefined) | Given a function table, students will be able to:   1. Identify two points on a table of values that represent a linear relationship. 2. Calculate the change in the y-values(rise) and the change in the x-values(run) between two selected points. 3. Apply the slope formula (change in y/ change in x) to find the rate of change(slope) between two points.   . | |  |
| **Guided HOT Questions** | How can you find the slope of a line when given two points on the line? | If the rise and run between two points on a line are the same, what can we conclude about the slope? | In what ways does the slope help us understand real-world situations, such as speed, cost, or distance? | |  |
| **Warm Up/Do Now** | What is the slope of the line if it goes through the points (1,3) and (3,9)? |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Hour | 1 | 2 | 3 | 4 | | Amount earned | 6 | 12 | ? | ? | | |  |
| **Learning Experience (aligned to Instructional Model)**   * **Guided Practice (I do/We do)** * **Independent Practice (you do)** * **Incorporate WICOR** * **Incorporate technology for assessment** * **Academic Discourse** | ****I Do****In the last lesson, we didn’t calculate the slope; we simply counted the squares on the graph to find the rise and run. But in today’s lesson, we’ll actually calculate the slope using two chosen coordinate points. This method will give us a more accurate way to find the slope, especially when the points don’t align perfectly with the grid squares.  Choose **Two Points on the Line**: Start by selecting two clear points on a line, where each point lies at the corner of a square on the graph. Label these points as (x1,y1, )(x2​,y2​).   Count **the Rise and Run**:  Count the number of squares from the first point to the second point vertically (rise) and horizontally (run). Make sure to note whether you move up or down for the rise (up is positive, down is negative) and left or right for the run (right is positive, left is negative).  Record the rise and run values based on your counts.   Calculate  **Using the Slope Formula**:  Write down the slope formula: m=y2-y1/x2-x1 ​​  Substitute the y-values and x-values of the points into the formula.  Simplify the subtraction in the numerator to find the vertical change (rise) and the denominator to find the horizontal change (run).  **Compare the Results**:  You’ll find that the results from counting the squares and using the formula give you the same rise/run ratio, or slope, for the line.  Emphasize that counting the squares and calculating the slope both represent the same concept of "rise over run," just done in slightly different ways.  **Explanation**: Start by explaining that the slope tells us how steep a line is and can be calculated by choosing two points on the line and using the slope formula.  **Demonstration**: Show students how to choose two points on a sample line on the graph. Point out that these points should ideally be where the line crosses the x- or y-axis, at corners of grid squares, or where there are whole-number coordinates.    **Identify Coordinates**: Label the points as (x1, y1) on the board and write down their coordinates.    **Use the Formula**: Substitute the coordinates into the slope formula: m=y2−y1/x2-X1. ​​ Walk through the calculation step-by-step, showing how to simplify to get a single number for the slope.  **Interpret the Result**: Explain how to interpret the slope: if the result is positive, the line rises; if negative, it falls; if zero, the line is horizontal; and if undefined (when dividing by zero), the line is vertical. ****We Do**** **Guided Practice**: Choose another line on the graph and go through the steps together as a class.  **Choose Two Points**: Ask students to help select two points that meet the criteria (where the line crosses an axis, grid corner, or whole-number coordinates).  **Identify Coordinates**: Call on students to help identify (x1,y1) (x2​,y2​) for the chosen points.  **Apply the Slope Formula**: Work through the calculation together, allowing students to participate by solving parts of the formula.  **Interpret the Slope**: Ask students what the result tells us about the line (positive, negative, zero, or undefined slope). ****You Do**** Schoology Worksheet | I do:  Example 1.  To find the slope between two points (0,6) and (3,0).  Identify the coordinates:  x1 = 0 y1 = -6 x2 = 3 y2 = 0 Now let's plug into our formula:  m=y2-y1/x2-x1  = 0-(-6) / 3-0  =6/3  m=2  Guided practice:  **Example 2**:  To find the slope between two points (0,-3) and (7,2)  x1 = 0 y1 = -3 x2 = 7 y2 = -2  Now let's plug into our formula:  m=y2−y1/x2−x1  m=−2−(−3)/7−0  m=−2+3/7  m=1/7  Ask student to identify the type of slope.  Independent Practice: | I do:  Use the table below to illustrate how to find the slope   |  |  | | --- | --- | | x | y | | 1 | 2 | | 3 | 6 | | 5 | 10 | | 7 | 14 |   Ask the students to select two points from the table. For example, (1,2) and (3,6)  Show to to calculate the change in y and x:  Change in y (rise) = 6-2 =4  Change in x (run) = 3-1  Calculate the slope: rise/run  m= 4/2 =2  Guided Practice:  Provide students with a new table   |  |  | | --- | --- | | x | y | | 2 | 3 | | 4 | 7 | | 6 | 11 | | 8 | 15 |   Have students work in pairs to find the slope.  Guided them through selecting two points.  Ask them to calculate the change in y and x, then the slope.  Independent Practice: | |  |
| **Expected Errors in Student Thinking** | Students may miscalculate the slope by reversing the order of subtraction, resulting in an incorrect sign for the slope. | Students might assume they’ve already converted the equation when they haven’t fully isolated y. | **Confusing the Sign When Substituting the Point** | |  |
| **Aggressive Monitoring/ Checks for Understanding** | Check: Walk around and check students' work, offering guidance as needed. | Check: Walk around and check students' work, offering guidance as needed. | Check: Walk around and check students' work, offering guidance as needed. | |  |
| **Differentiation for Special Populations**   * **EB** * **SPED** * **GT** | EB: Provide visual aids and vocabulary lists.  SEPD L Scaffolded instruction, extra time, calculator  504: Simplified instructions and additional time. | EB: Provide visual aids and vocabulary lists.  SEPD L Scaffolded instruction, extra time, calculator  504: Simplified instructions and additional time. | EB: Provide visual aids and vocabulary lists.  SEPD L Scaffolded instruction, extra time, calculator  504: Simplified instructions and additional time. | | EB: Provide visual aids and vocabulary lists.  SEPD L Scaffolded instruction, extra time, calculator  504: Simplified instructions and additional time. |
| **Daily Formative Assessment of Success Criteria** | Exit Ticket | Exit Ticket | Exit Ticket | | Exit Ticket |
| **Exemplars of student responses/outcomes** | students will be able to correctly identify two points on a line, count the rise and run, and accurately apply the slope formula to calculate the slope, demonstrating their understanding of the rate of change between two points on the graph. | Given two coordinates, students will be able to correctly calculate the slope by applying the slope formula to determine the rate of change between the two points.  4o mini  Top of Form  Bottom of Form | Given a table of values, students will be able to accurately calculate the slope by selecting two points and applying the slope formula to determine the rate of change between the values.  4o mini  Top of Form  Bottom of Form | |  |
| **Small Group Instruction** | Targeted help for students struggling with equations | Targeted help for students struggling with equations | Targeted help for students struggling with equations | |  |