Daily Lesson Plan

Lesson Plan: Understanding Slope Using Right Triangles
Subject: 8th Grade Math

TEKS Standard: MATH.8.4.A
Proportionally: The student applies mathematical process standards to explain proportional and non-proportional relationships involving slope. The Student is expected to: (A) use similar right triangles to develop an understanding that slope, *m*, given as the rate comparing the change in y-values to the change in x-values, (y2 -y1) / (x2-x1), is the same for any two points (x1,y1) and (x2,y2) on the same line.

Objective(s):
Students will understand and be able to explain that the slope of a line is consistent between any two points on that line by using similar right triangles.

Materials Needed:
- Graph paper
- Rulers
- Calculators
- White board and markers
- Projector or smartboard
- Slope formiula handouts
- Interactive slope tools (online graphing calculators or apps)

Lesson Duration:
1 Class Period (approximately 60 minutes)

Lesson Outline

1. **Introduction (10 minutes)**
    - Begin with a brief review of what students already know about ratios and proportional relationships.
    - Introduce the concept of slope as a rate of change between two point on a line.
    - Show a graph with a line and two points on the smartboard/projector.
2. **Direct Instruction (15 minutes)**
    - Define slope using the formula; (y2 -y1) / (x2-x1)
    - Explain that this formula calculates the steepness or incline of a line by comparing the vertical change (rise) to the horizontal change (run) between two points.
    - Draw a right traiingle on the graph to visually demonstrate the rise and run between two points on the line.
    - Discuss how these right triangles are similar (same shape, different size) and how their corresponding sides are proportional.

3. **Guided Practice (15 minutes)**
    - Distribute graph paper and hae students plot two point on a coordinate plane
    - Ask students to draw the right triangle connecting these points and label the rise and run.
    - Using the slope formula, have students calculate the slop of the line through their points.
    - Repeat this process with a different set of points on the same line to show that the slope remains consistent.
4. **Interactive Activity (10 Minutes)**
    - Use an online graphing tool or app to plot multiple lines and points.
    - Allow students to manipulate the point and observe how the slope remains the same for any two points on the same line.
    - Encourage students to work in pairs and explain their observations to each other.

5. **Independent Practice (5 minutes)**
    - Provide a set of coordinates for students to calculate the slope individually.
    - Include questions that ask students to explain why the slope is the same for any two points on the line.

6. **Closure (5 minutes)**
    - Recap the day's lesson by asking students to share their findings and understanding of slope
    - Highlight the importance of similar triangles in understanding the consistency of slope.
7. **Assessment**
    - Collect the independent practice work to assess students' understanding of the concept.
    - Provide a short exit ticket with a problem requiring the calculation of slope using the slope formula.

Differentiation:

- **For Advanced Students:**
  Provide more complex problems involving lines with gractional slopes or negative slopes.

- **For Struggling Students:**
  Offer additional practice with simpler, whole-number coordinates and provide one-on-one assistance as needed

Homework:
Assign practice problems from the textbook or an online resource that reinforce the day's lesson on calculating and understanding slope.
Reflection:
After the lesson, reflect on students' engagement and understanding. Adjust future lessons based on their feedback and performance.
By using similar right triangles, students can visually and mathematically grasp why the slope remains consistent between any two points on a line, reinforcin their understanding of proportionality in mathematical relationships.