**Graphing Linear Equations: Venice Florida Weather**

**Teacher:**
**School:** Venice High School
**City, State:** Venice, Florida

**Curriculum Area:** Mathematics – Algebra
**Grade Level:** 9/10

**PURPOSE:**
Using “real-world” local weather data, students will develop an understanding of the applications for linear equations and their graphical displays. Students will use a “line of best fit” to identify the linear trend of the daily maximum temperatures of a three-or-four month duration.

**WHAT STUDENTS SHOULD ALREADY KNOW:**
Students should be proficient with the concept of **y=mx + b**, specifically with graphing linear equations as well as deriving the linear equation given the graphical representation.

**DESCRIPTION:**
The proposed lesson will follow after becoming familiar with slope intercept form, manipulating an equation, and graphing equations. During this lesson, students will participate in a cooperative learning activity of graphing local weather data, and matching a graphic display with a “line of best fit,” and deriving an equation for this line.

Students will communicate their understanding of the concepts learned through a journal entry as well as a follow-up class discussion.

This is a fundamental building block of algebra; therefore, this concept can be used as an enrichment activity, or as a direct instructional tool.

**ACTIVITIES:**

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| **Procedures:** | **Notes/Examples :** |
| **WARM-UP:**Provide a brief into and review of linear equations. Strategy:Independent work, in order to assess each student’s proficiency. Group discussion will follow immediately. |  (Write on the board)Using complete sentences, answer the following question: “What does y=mx + b mean?”Also, draw a line on a graph and have students derive the linear equation. |
| Working in groups of three or four, students will take a data set and create its graphic representation.Students will locate the MAXIMUM/MINIMUM DAILY TEMPERATURES for each day, and plot these temperatures over time. Students will be instructed to use two colors (or pen/pencil combination) to differentiate the two graphs.Then students will regroup so that one from each original group will now be working with others with the same equation; students will do a peer assessment. Students return to their original group and take turns showing their group members how they arrived at their graphic display. All students are to complete each graphic as it is explained.  | Break the students into small groups, of preferably three or four each, using any desired method.Provide each group with ONE OR TWO WEEKS worth of weather data, based on the number of groups.The instructor should act as a guide and mediator, walking around the groups to monitor the progress of each. |
| Each group will approach the front of the classroom, where there will be a large “master graph” set up.Finding their own time span on the master graph, each group will reproduce their graph accordingly so that the entire class may view their findings. Each group will use a different colored marker, if possible. | The “master graph” may be pre-drawn on the board by the instructor prior to class. Alternative: one group may be instructed to produce the “mater graphing area” (ex: setting the scale & axes) instead of plotting. Another alternative is to use a special graph paper that is approximately 3 feet tall and comes in a large roll. |
| Students will draw conclusions about the slope and intercepts of the master graph.A “line of best fit” will be devised, and its equation will be defined.  | This is a wonderful opportunity for an entire-class discussion of “line of best fit” |
| As a summation, students will write an entry in their journal that demonstrates their understanding of the concepts they have learned. | Alternatively, a worksheet or textbook homework may follow. |

**Lesson Developed by: Stephen Case and Robert Lash**

**Teaching Strategy:**
Allowing students to work in groups makes it less threatening and also gives each student a support group. Many times, students dislike like math because they are afraid they will fail (or possibly are threatened by the subject itself). Giving students a support group to fall back on is like having a safety net and thus makes them more willing to try.

**Student Characteristics:**
All students learn at different rates and through different modes, so for that reason I have tried to make this lesson as well-rounded as possible. Note that we still do concrete and abstract activities as well as individual and group-wide creative thinking. The students in this lesson do not need to be what I would call “typical math students,” and with the use of the technology (ex: graphing calculators), this lesson can provide “lower level” students with somewhat of an opportunity to fail and retry until success is found.