Unit Title: "The Burning Candle: Patterns and Graphs"

Course: Algebra I (High School)

Subject Area: Mathematics

Time Frame: 13 days

Standards

Algebra I Standards	**Sunshine State Standards Benchmarks**	**NCEE New Standards**
The student will: 7.4 Graphs sets of ordered pairs, linear equations in two variables. 7.5 Find images for transformations. 7.7 Graphs equations of the form $y = ax^2 + bx + c$, where a, b, and c are real numbers.	MA.C.2.4.1 The student will understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, reflections, symmetry, *and transformations including flips, slides, turns, enlargements, rotations, and fractals.* MA.C.3.4.2 The student will using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three*-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.	The student: M2b Identifies similar and congruent shapes and uses transformations in the coordinate plane, i.e., translations, rotations, and reflections. M2d Determine and understands length, area, and volume, including perimeter and surface area, uses units, square units, and cubic units of measure correctly; computes area of rectangles, triangles, and circles; computes volumes of prisms. M3a Discovers, describes, and generalizes patterns, including linear, exponential, and simple quadratic relationships, i.e., those of the form $f(n) = n^2$ of $f(n) = cn^2$ for constant c, including $A = \pi r^2$, and re[resent them with variables and expressions. M3b Represent relationships with tables, graphs in the coordinate plane, and verbal or symbolic rules.

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
Students will understand: • A relationship is linear if there is a constant rate of change between the two variables. • Slope is the ratio of the vertical change to the horizontal change.	• How can an equation express a relationship we see in the everyday world? • When two related quantities change, how can we tall whether the change is predictable? • How can we tell whether it can be expressed by a mathematical equation? • How can the graph made from a table of specific values help us predict other values? • Can graphs help us predict changes between related variables if the variables are not related in a linear way?	Students will know • Key terms (e.g., coordinate pairs, linear, linear relationship, point of intersection, rise, run, slope, y-intercept). Students will be able to • Graphs sets of ordered pairs, linear equations in two variables by using intercepts, slope and a point, and point-plotting. • Find images for transformations. • Graph equations of the form $y = ax^2 + bx + c$, where a, b, and c are real numbers.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
• **Algebra Walk** The Algebra Walk gives students an unconventional introduction to the xy-coordinate system. Students are given data sheets and colored cards. The cards are printed with the rule for generating ordered pairs (x, y) together with one integer between –6 and 6 for x. Students will determine the ordered pair and walk the coordinate grid to find their position on the grid. Each student will also sketch the "human graph." • **Silent Board Games** Students are introduced to the idea of making a table, finding a pattern, and writing an equation to solve a problem. A table	Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test	Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
with missing entries is shown on the overhead. Students remain silent during this game. They raise their hands to be recognized, write answers, then sit down. The correct answers are left while incorrect answers are erased. Students should come up with a rule at the end of each game.		