

| <p style="text-align: center;">Algebra II Framework for FORMATIVE/CLASSROOM Instruction and Assessment English language learners communicate information, ideas, and concepts necessary for academic success in the content area of MATHEMATICS.</p> | | | | | | | | |
|---|--|--|---|---|--|--|--|------------------------------|
| <p>PA Academic Standard(s) Develop content appropriate for the topic. 1.5.11.B.</p> <ul style="list-style-type: none"> Gather, organize and determine validity and reliability of information. Employ the most effective format for purpose and audience. Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus. <p>Use grade appropriate conventions of language when writing and editing. 1.5.11.F. Demonstrate awareness of audience using appropriate volume and clarity in formal speaking presentations. 1.6.11.B. Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.1.A2.F. Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results. 2.5.A2.B. Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.B. Recognize, describe and generalize patterns using sequences and series to predict long-term outcomes. 2.8.A2.C. Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic) 2.8.A2.D. Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.E.</p> | | | | | | | | |
| Speaking | | | | | | | | |
| Concepts | Competencies | Vocabulary | Level 1 Entering | Level 2 Beginning | Level 3 Developing | Level 4 Expanding | Level 5 Bridging | Level 6- Reaching |
| Algebraic properties, processes and representations Exponential functions and equations Quadratic functions and equations Polynomial functions and equations | Extend algebraic properties and processes to quadratic, exponential, and polynomial expressions and equations and to matrices, and apply them to solve real world problems. Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each | Absolute value Central tendency Complex numbers Composite function Composite number Congruent Conjecture Converse Direct proof | Identify orally whether an equation or expression is quadratic, linear, exponential or polynomial in a one-word response. | Evaluate a quadratic, exponential, or polynomial function in a group using visual support and vocabulary support. | Evaluate a quadratic, exponential, or polynomial function in a small group or individually with vocabulary support | Justify the application of a quadratic, exponential or polynomial function as applied to a real-life scenario, Evaluate the usefulness of the function in a small group. | Present findings of a grade-level experiment or project dealing with population growth or other topic related to functions. Reason backwards given a non-traditional or | Level 6- Reaching |

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| <p>Compound probabilities: addition and multiplication rules</p> | <p>representation.</p> <p>Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.</p> <p>Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.</p> <p>Distinguish between independent and dependent events in order to calculate compound probabilities within real world situations.</p> | <p>Domain Equation Equivalent forms Exponential function Exponential notation Expression Interquartile Range Inverse Irrational number Line of best fit Linear function Logarithmic function Powers Prime Probability Proof by contradiction Rational numbers Reciprocal Scientific notation Systems of equations Transformation Trigonometric functions Variable Valid argument Variable</p> | | | | | <p>mixed graphic representation of a scenario to reconstruct the scenario (e.g. population growth, endangerment, extinction).</p> | |
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| Writing | | | | | | | | | |
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| Concepts | Competencies | Vocabulary | Level 1 Entering | Level 2 Beginning | Level 3 Developing | Level 4 Expanding | Level 5 Bridging | | |
| | | | <p>Copy the process used to solve an algebraic equation, inequality.</p> <p>Enter equations into the y= screen on a graphing calculator.</p> | <p>Create tables and graphs of quadratic, linear, exponential or polynomial equations.</p> | <p>Write a paragraph that aligns the various representations of a graph to the solution of a graph in context of a real-world problem.</p> | <p>Write a justification to an evaluation of a quadratic, exponential or polynomial function in a real-life scenario using graphic organizers.</p> | <p>Write a professional report outlining the use and evaluation of a function in a real-life scenario, including student-made graphics.</p> | Level 6- Reaching | |
| Content Stems | | | | | | | | | |
| | | | <p>Quadratic linear exponential and polynomial equations Multiple representations Problem solving Writing math language Communicating mathematically</p> | <p>Quadratic linear exponential and polynomial equations Multiple representations Problem solving Write math language Communicate mathematically</p> | <p>Recognize real-world scenarios Engage in mathematical discourse</p> | <p>Read mathematical writing and technical text Find and correct errors in mathematical thinking</p> | <p>Write a professional report Outline the use and evaluation of a function in a real-life scenario, including student-made graphics</p> | | |
| Instructional Support | | | | | | | | | |
| | | | <p>Algebra tiles Class-created data Teacher</p> | <p>Teacher modeling Think-pair-share</p> | <p>Teacher modeling Think-pair-share</p> | <p>Think-pair-share Cooperative learning</p> | <p>Think-pair-share Cooperative learning</p> | | |

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| | | | <p>modeling Think-aloud Think-pair-share Cooperative learning Visual aids Personal dictionaries Picture dictionaries Real-life objects Direct translation dictionaries</p> | <p>Think-aloud Cooperative learning Visual aids Personal dictionaries Picture dictionaries Real-life objects Direct translation dictionaries</p> | <p>Think-aloud Cooperative learning Visual aids Personal dictionaries Picture dictionaries Real-life objects Direct translation dictionaries</p> | <p>Visual aids Personal dictionaries Picture dictionaries Real-life objects Direct translation dictionaries</p> | <p>Visual aids Personal dictionaries Real-life objects Direct translation dictionaries</p> |
| Language Use | | | | | | | |
| | | | <p>Speaking Respond orally to Y/N questions</p> | <p>Speaking Analyze charts and graphs modeling real-life data with a partner</p> | <p>Speaking Give an oral presentation with visual support</p> | <p>Speaking Debate/dispute in class discussion the validity of arguments and errors in mathematical thinking</p> | <p>Speaking Give formal presentations</p> |
| | | | <p>Writing Write equations in a graphing calculator Write simple equations</p> | <p>Writing Evaluate more complex equations and construct a visual representation of the data in a chart or coordinate plane</p> | <p>Writing Write paragraphs Create PowerPoint presentations Support answers with justification</p> | <p>Writing Write persuasively Respond to open-ended items</p> | <p>Writing Write a business document or report Make recommendations based on the analysis of graphs, tables, or equations</p> |