

Elementary Mathematics Specialist For Grades K-6. (Ed 614.14) Reviewer Assessment Worksheet

Ed 614.14 Elementary Mathematics Specialist For Grades K-6.

Directions: This matrix worksheet should be completed by the reviewer while assessing the program standards' compliance through review of the matrix submitted by the institution and data gathering at the Visit.

Ed 614.14 ELEMENTARY MATHEMATICS SPECIALIST FOR GRADES K-6	Rating 4: Highly effective 3: Effective 2: Needs improvement 1: Ineffective	Describe the rationale for the rating and comment on how the program provides evidence and data to address the standard and inform continuous improvement. Indicate the relationship to Ed 610.02 Professional Education standards (if any).
<p>(a) The elementary mathematics specialist program for grades k-6 shall provide the candidate with the ability to meet the entry level requirement for all elementary mathematics specialists with a master's degree in mathematics, education or a related field from a college or university.</p>		
<p>(b) The graduate program for grades k-6 shall provide the teaching candidate with skills, competencies, and knowledge through a combination of academic and supervised clinical experiences including three semester hours or equivalent in a supervised clinical school-based internship in the following areas:</p>		
<p>(1) In the area of content knowledge have the ability to:</p>		
<p>a. Apply knowledge of major pk-6 mathematical concepts, algorithms, procedures and connections;</p>		

<p>b. Demonstrate an understanding of the sequential nature of mathematics and the mathematical structures and connections inherent in the following content domains:</p>		
<p>1. In the domain of number and operations have the ability to:</p> <ul style="list-style-type: none">(i) Demonstrate knowledge of pre-number and early number concepts;(ii) Interpret and represent number systems including whole numbers, integers, rationals, irrationals, reals and the application of their properties;(iii) Demonstrate knowledge of concepts and applications of number theory including multiplicative arithmetic;(iv) Demonstrate a variety of interpretations of the four operations of arithmetic and of the common ways they can be applied; and(v) Use proportional reasoning demonstrating connections to fractions, ratios, rates, and scaling;		

<p>2. In the domain of functions and algebra have the ability to:</p> <ul style="list-style-type: none">(i) Analyze and generalize a wide variety of patterns and functions for example linear, quadratic, and exponential, moving fluently among representations including tables, graphs, written word, and symbolic rules;(ii) Analyze change and rates of change in various contexts including proportional and inversely proportional relationships;(iii) Model and solve problems, both mathematical and “real world,” using algebraic methods; and(iv) Apply the conventions of algebra that is the order of operations and the properties of real numbers commutative, associative, distributive, identity, inverse, and zero properties to algebraic expressions, equations, and inequalities;		
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<p>3. In the domain of measurement have the ability to:</p> <ul style="list-style-type: none">(i) Utilize non-standard and standard units of measure using appropriate units, techniques, and tools;(ii) Model and use common units of geometric measures for: angles, perimeter, area and volume, through mathematical and practical contexts;(iii) Employ estimation as a way of understanding measurement units and processes of measuring those attributes;(iv) Apply measurement conversion strategies; and(v) Connect proportionality to measurement including similar figures;		
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<p>4. In the domain of geometry have the ability to:</p> <ul style="list-style-type: none">(i) Build and manipulate representations of two- and three-dimensional objects using concrete models, perspective drawings, projections, and dynamic geometry software;(ii) Analyze properties and relationships among geometric shapes and structures;(iii) Specify locations and describe spatial relationships using coordinate geometry;(iv) Apply transformations and compositions of transformations (including dilations, translations, rotations, and reflections) with symmetry, congruence, and similarity; and(v) Use geometric constructions and axiomatic reasoning to make and prove conjectures about geometric shapes and relations;		
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<p>5. In the domain of data analysis and probability have the ability to:</p> <ul style="list-style-type: none">(i) Use data from a random sample to draw inferences about a population;(ii) Construct and interpret graphical displays of univariate data distributions for example, box plots and histograms;(iii) Summarize and describe univariate data in relation to its context by using measures including the mean, median, mode, interquartile range, and mean absolute deviation;(iv) Use scatterplots to analyze bivariate data and utilize lines of best fit to model the relationship between the variables; and(v) Determine the empirical and theoretical probability for both simple and compound events; and		
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<p>c. Demonstrate knowledge of the history of mathematics, including the contributions of different individuals and cultures toward the development of mathematics and the role of mathematics in culture and society;</p>		
<p>(2) In the area of mathematical practices have the ability to:</p> <ul style="list-style-type: none">a. Communicate and demonstrate the importance of problem solving and its use in developing conceptual understanding;b. Represent and model mathematical ideas;c. Reason abstractly, reflectively, and quantitatively including constructing viable arguments and proofs;d. Attend to precision;e. Identify elements of structure and express regularity in patterns of mathematical reasoning;f. Utilize appropriate mathematical vocabulary and symbols to communicate mathematical ideas; andg. Demonstrate the interconnectedness of mathematical ideas including making connections across various content areas and real-world contexts;		

<p>(3) In the area of mathematical pedagogy have the ability to:</p> <ul style="list-style-type: none">a. Plan and assist others in planning instruction incorporating a variety of strategies including mathematics-specific instructional technologies to build all students' conceptual understanding and procedural proficiency;b. Analyze and consider research in planning for mathematics instruction;c. Select and apply instructional techniques that assist in identifying and addressing student misconceptions;d. Use mathematical content and pedagogical knowledge to select, use, adapt and determine the suitability of mathematics curricula and teaching materials for particular learning goals;e. Understand students' development in mathematics using holistic, analytical, and diagnostic tools; andf. Demonstrate developmentally appropriate use of assessments in their practice and train classroom teachers to administer and interpret assessment results; and		
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<p>(4) In the area of professional knowledge and skills have the ability to:</p> <ul style="list-style-type: none">a. Demonstrate mathematics-focused instructional leadership;b. Plan, develop, implement and evaluate mathematics-focused professional development programs;c. Evaluate the alignment of state mathematical standards, district curricula, state and local assessments and recommend appropriate adjustments;d. Support teachers in systematically reflecting on and learning from their mathematical practice;e. Collaborate with school-based professionals to develop evidence-based interventions for high-and low- achieving students; andf. Analyze and interpret mathematics assessment data and communicate results to appropriate and varied audiences.		
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