**Effective January 1, 2024**

## 505-3-.92 K-5 MATHEMATICS ENDORSEMENT

**(1) Purpose.**

(a) This rule describes requirements and field-specific content standards for approving endorsement programs that prepare mathematics specialists for teaching students in grades K-5 and supplements requirements in Rule 505-3-.01 REQUIREMENTS AND STANDARDS FOR APPROVING PROFESSIONAL EDUCATION UNITS AND EDUCATOR PREPARATION PROGRAMS.

(b) This endorsement is designed to strengthen and enhance educator competency levels. Individuals teaching mathematics in grades K-5 who hold a valid, level 4 or higher Induction, Professional, Advanced Professional, or Lead Professional teaching certificate and this endorsement will be eligible to earn salary incentives when funded by the General Assembly. The endorsement applies to educators teaching within grades K-5 but it does not modify the grade levels of the base certificate. For example, educators with the Middle Grades Mathematics (4-8) certificate and this K-5 endorsement are only in-field to teach mathematics in grades 4-8. They will be eligible for salary incentives only if they are assigned to teach mathematics in grades 4 or 5.

(c) Individuals with the following certificates will be eligible for pay incentives if they are assigned to teach mathematics in the grade levels defined below:

1. Elementary Education (P-5) certificate holders will be eligible to earn pay incentives if they are assigned to teach mathematics to children in grades K-5.

2. Middle Grades Mathematics (4-8) certificate holders will be eligible to earn pay incentives if they are assigned to teach mathematics to children in grades 4-5.

3. Special Education General Curriculum/Elementary Education (P-5) certificate holders will be eligible to earn pay incentives if they are assigned to teach mathematics to children in grades K-5.

4. Educators holding the following certificates and a core academic content concentration in mathematics will be eligible to earn pay incentives if they are assigned to teach mathematics to children in grades K-5:

   (i) Special Education General Curriculum (P-12)

   (ii) Special Education Adapted Curriculum (P-12)

   (iii) Special Education Behavior Disorders (P-12)

   (iv) Special Education Learning Disabilities (P-12)

   (v) Special Education Deaf Education (P-12)

   (vi) Special Education Physical and Health Disabilities (P-12)

   (vii) Special Education Visual Impairment (P-12)

   (viii) Gifted Education (P-12)

**(2) In-Field Statement**. Completers of the K-5 Mathematics Endorsement program have strengthened and enhanced competency levels in mathematics content and instruction for teaching students in grades Kindergarten through five, based on the grade levels of their base certificate.

**(3) Requirements.**

(a) To be eligible to enroll in this endorsement program, the educator must have:

1. A valid, level 4 or higher Induction, Professional, Advanced Professional, or Lead Professional teaching certificate, in one of the following fields:

(i) Elementary Education (P-5);

(ii) Middle Grades Mathematics (4-8);

(iii) Special Education General Curriculum/Elementary Education (P-5); or

(iv) any of the following certificates combined with a core academic content concentration in mathematics:

(I) Special Education General Curriculum (P-12);

(II) Special Education Adapted Curriculum (P-12);

(III) Special Education Behavior Disorders (P-12);

(IV) Special Education Learning Disabilities (P-12);

(V) Special Education Deaf Education (P-12);

(VI) Special Education Physical and Health Disabilities (P-12);

(VII) Special Education Visual Impairment (P-12); or

(VIII) Gifted Certificate (P-12); and

2. A minimum of one year of teaching experience.

(b) The program may be offered only by a GaPSC-approved educator preparation provider.

(c) The program shall be offered as a post-baccalaureate endorsement and may not be embedded in an initial preparation program.

(d) The program shall require candidates to complete an authentic residency. An authentic residency is defined as a supervised and coordinated series of real applications of knowledge and skills occurring in actual classroom settings that allow candidates to further develop and demonstrate the knowledge and skills acquired in coursework. Residency experiences shall require demonstration of the content knowledge and pedagogical skills delineated in program content standards. Authentic residency experiences shall occur in candidates' assigned classrooms, as well as in settings other than candidates' assigned classrooms to ensure experiences with a variety of students and with students in the grade levels of the candidate's base certificate. The authentic residency must include a portfolio component.

(e) The portfolio shall include but not be limited to: evidence of observations by supervisors, student work samples including analysis of student work, self-reflection and evidence of competence in the six standards specified below.

(f) The preparation program described in program planning forms, catalogs, and syllabi shall require a minimum of three courses of which two courses shall be focused on the advancement of content knowledge and one course shall be focused on content-specific pedagogy and proven

strategies that address the following standards adapted from the standards published in 2020 by the National Council of Teachers of Mathematics (NCTM), as well as portions of the 2014 NCTM document titled, *Principles to actions.*

1. Knowing and Understanding Meaningful Mathematics: Candidates demonstrate conceptual understanding, procedural fluency, application, and progression within and among the major concepts of mathematics appropriate for grades K–5:

    (i) Number and Operations

        (I) Prenumeration concepts and numeracy progression;

        (II) Development, use, and multiple representation of numbers and number systems;

        (III) Numbers (whole numbers, fractions, decimals, percents) and their relationships;

        (IV) Place value, in the study of base ten and other number systems, and flexible use with operations;

        (V) Model the use of the four basic operations in multiple contexts with the understanding of common additive/multiplicative problem situations/types;

        (VI) Four basic operations with positive and negative rational numbers;

        (VII) Use a variety of mental computation techniques or computational strategies;

        (VIII) Apply estimation strategies to quantities, measurements, and computation to determine the reasonableness of results;

    (ii) Algebraic Thinking

        (I) Describe, extend, and generate patterns; model various kinds of growth, both numerical and geometric;

        (II) Symbols – such as representing unknowns or relationships (e.g. equals sign);

        (III) Generalization;

        (IV) Relationships – describe and represent mathematical relationships;

        (V) Algebraic concepts that focus on properties of the number system and their connection to the order of operations;

        (VI) Model, explain, and develop a variety of (invented and standard) computational algorithms;

        (VII) Write, interpret, and evaluate numerical expressions within real-life problems;

        (VIII) Logical conjectures and conclusions using quantifiers such as “all”, “some”, and “none”;

    (iii) Statistical Reasoning

        (I) The nature and use of data;

(II) Categorical and numerical data;

(III) Statistical investigative questions;

(IV) Data collection, organization, and representation;

(V) Elementary data analysis;

(VI) Drawing conclusions and making inference;

(iv) Geometry and Measurement

(I) Measurement as a concept, an attribute of a shape (what does it mean to have a measure, and what are you measuring);

(II) Measurement of time;

(III) Measurement of one-, two- and three-dimensional objects using nonstandard, customary and metric units;

(IV) Conversion of measurement units;

(V) 1D, 2D and 3D shapes and their properties;

(VI) Spatial visualization;

(VII) Location;

(VIII) Use geometric concepts and relationships to describe and model mathematical ideas and real world constructs.

2. Knowing and Using Mathematical Processes: Candidates demonstrate, within or across mathematical domains, their knowledge of and ability to apply the mathematical processes of:

(i) Problem Solving. Candidates demonstrate a range of mathematical problem-solving strategies to make sense of and solve cognitively-demanding tasks, both contextual and non-contextual.

(ii) Reasoning and Communicating. Candidates organize their mathematical thinking and use the language of mathematics to express ideas precisely in verbal and written formats.

(iii) Modeling. Candidates apply their mathematical knowledge to analyze and model contextual problems. They use models such as manipulatives, tables, diagrams, and graphs, equations, and technological tools to represent the mathematical relationships in contextual problems.

3. Knowing Students and Planning for Mathematical Learning: Candidates use knowledge of students and mathematics to plan rigorous and engaging mathematics instruction supporting all students' access and learning. The mathematics instruction that is developed provides fair and impartial, culturally responsive opportunities for all students to go deep with mathematics, leverage multiple mathematical competencies, affirm mathematical identities, challenge spaces of marginality, and draw on multiple resources of knowledge.

(i) Student Differences. Candidates design lessons in which all students have access to engage in meaningful mathematics, drawing upon cultural, linguistic, and academic differences. Candidates draw on student and community assets during lesson preparation that draw on student thinking and experiences.

(ii) Student Mathematical Strengths. Candidates recognize the mathematical strengths in each and every student. Candidates plan instruction to draw upon the variety of mathematical strengths present in the classroom.

(iii) Student Thinking about Mathematical Content. Candidates anticipate students' mathematical thinking. Candidates plan for instruction that attends to this thinking and is grounded in mathematical learning progressions.

(iv) Student Mathematical Identities. Candidates design learning experiences and plan instruction that develop and foster positive mathematical identities, grounded in the understanding that teachers' interactions impact individual students by influencing and reinforcing students' mathematical identities, positive or negative. They build lessons in which students are able to see themselves. Candidates purposefully group students to promote positive mathematical learning and identities, with the awareness of the negative impacts of homogeneous and static grouping practices.

4. Teaching Meaningful Mathematics: Candidates plan and implement effective teaching practices to support rigorous mathematical learning for each and every student drawing upon their knowledge of students.

(i) Establish mathematics goals to focus learning. Candidates establish clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.

(ii) Implement tasks that promote reasoning and problem solving. Candidates engage students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.

(iii) Use and connect mathematical representations. Candidates engage students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.

(iv) Facilitate meaningful mathematical discourse. Candidates facilitate discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.

(v) Pose purposeful questions. Candidates use purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.

(vi) Build procedural fluency from conceptual understanding. Candidates build fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.

(vii) Support productive struggle in learning mathematics. Candidates consistently provide students, individually and collectively, with opportunities and support to engage in productive struggle as they grapple with mathematical ideas and relationships.

(viii) Elicit and use evidence of student thinking. Candidates use evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

5. Assessing Impact on Student Learning: Candidates use appropriate assessment methods to collect and analyze evidence of students' mathematics learning, modify instruction, monitor teaching effectiveness, and evaluate program effectiveness.

(i) Assessing for Learning. Candidates select, modify, and create a variety of formative methods to elicit information on students' progress toward mathematical learning goals.

(ii) Modify Instruction. Candidates use formal and informal formative assessment data regarding learning of individual students, the class as a whole, and subgroups in order to analyze the effectiveness of their instruction. Candidates propose adjustments and modify instruction.

(iii) Analyze Assessment Data. Candidates collect and use summative assessment data regarding learning of individual students, the class as a whole, and subgroups in order to determine mastery of learning goals.

6. Personal, Social, and Professional Context of Mathematics Education: Candidates are reflective mathematics educators who collaborate with colleagues and other stakeholders to grow professionally, and foster and advocate for fair and impartial mathematics learning environments.

(i) Demonstrate a Positive Mathematical Identity. Candidates reflect on and pursue continuous growth of a positive mathematical identity.

(ii) Collaborate with Families and Community. Candidates collaborate with families and other stakeholders to share and discuss strategies for ensuring children's mathematical success.

(iii) Participate in Professional Organizations and Communities. Candidates are involved in and draw upon the resources of professional communities in mathematics education.

(iv) Consider Social Context of Mathematics Teaching and Learning. Because social, historical, and institutional contexts of mathematics affect teaching and learning, candidates will know about and integrate these ideas in their instruction.

Authority O.C.G.A. § 20-2-200