

505-3-.68 EARLY CHILDHOOD MATHEMATICS ENDORSEMENT PROGRAM

(1) **Purpose.** This rule states field-specific content standards for approving endorsement programs that prepare mathematics specialists for P-5 students and supplements requirements in Rule 505-3-.01, Requirements and Standards for Approving Professional Education Units and Educator Preparation Programs.

(2) **Requirements.**

(a) A state-approved professional education unit shall offer this field as an endorsement to a level 4 or higher professional teaching certificate in Early Childhood (P-5).

(b) The preparation program described in program planning forms, catalogs, and syllabi shall require a minimum of twelve (12) semester hours in mathematics content and pedagogical content knowledge that address the following standards:

1. The program shall prepare candidates who understand and use the major concepts of mathematics appropriate for grades P-5. Candidates shall:

(i) demonstrate knowledge of the development, use and multiple representation of numbers and number systems.

(ii) demonstrate number sense and knowledge of number systems.

(iii) model the use of the four basic operations in multiple contexts.

(iv) use a variety of mental computation techniques.

(v) apply estimation strategies to quantities, measurements, and computation to determine the reasonableness of results.

(vi) model, explain, and develop a variety of computational algorithms.

(vii) apply the process of measurement to two and two- and three-dimensional objects using nonstandard customary and geometric units.

(viii) use geometric concepts and relationships to describe and model mathematical ideas and real world constructs.

(ix) collect, organize, represent, analyze, and interpret data.

(x) apply concepts of probability to real-world situations.

(xi) describe and represent mathematical relationships.

2. The program shall prepare candidates who have a knowledge of historical developments in mathematics that includes the contributions of underrepresented groups and diverse cultures.

3. The program shall prepare candidates who use their knowledge of student diversity to affirm and support full participation and continued study of mathematics by all

students. This diversity includes gender, ethnicity, socioeconomic background, language, special needs, and mathematical learning styles.

4. The program shall prepare candidates who use appropriate technology to support the learning of mathematics.

5. The program shall prepare candidates who use appropriate assessment methods to assess student learning and program effectiveness.

(i) The program shall prepare candidates who use formative and summative methods to determine students' understanding of mathematics and to monitor their own teaching effectiveness.

(ii) The program shall prepare candidates who use formative assessment to monitor student learning and to adjust instructional strategies and activities.

(iii) The program shall prepare candidates who use summative assessment to determine student achievement and to evaluate the mathematics program.

6. The program shall prepare candidates who can identify, teach, and model problem solving in grades P-5.

7. The program shall prepare candidates who use a variety of physical and visual materials for exploration and development of:

(i) prenumeration concepts,

(ii) numbers (whole numbers, fractions, decimals, percents) and their relationships,

(iii) four basic operations with positive and negative rational numbers,

(iv) geometric concepts and spatial visualization,

(v) measurement concepts and procedures,

(vi) algebraic concepts,

(vii) logical conjectures and conclusions using words such as all, some, and none, and

(viii) concepts of probability and elementary data analysis.

8. The program shall prepare candidates who use a variety of print and electronic resources.

9. The program shall prepare candidates who know when and how to use student groupings such as collaborative groups, cooperative learning, and peer teaching.

10. The program shall prepare candidates who use instructional strategies based on current research as well as national, state, and local standards relating to mathematics instruction.

11. The program shall prepare candidates who can work on an interdisciplinary team and in an interdisciplinary environment.

12. The program shall prepare candidates who participate actively in the professional community of mathematics educators.

Authority O.C.G.A. § 20-2-200