# Iowa Department of EducationAppendix 1: Program Self-Analysis/Phase 1

Programs use this tool to provide justification for alignment to the Mathematics Educator Competencies with detailed syllabi and coursework examples. Programs must ensure that evidence is not criteria-based (exposing students to the concepts), but instead performance-based (candidates must show evidence they meet the criteria). Evidence could include exams with true/false, multiple-choice, or short-answer questions.

## Domain 1: Understanding Mathematical Development

| **Criteria and Key Performance Area** | **Curriculum Written Evaluation and Evidence for Performance Indicators of Candidate Competency** | **Files** | **Self-Rating (based on rubrics in Workbook section 2)** |
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| 1.1 Reasonable goals and expectations for learners at various stages of mathematics development, including familiarity with the Iowa Academic Standards for Mathematics and the structure of high-quality instructional materials aligned to those standards. |  |  |  |
| 1.2 Understanding how students construct mathematical knowledge through the development of conceptual understanding, procedural fluency, and application, emphasizing fluency through strategic reasoning and metacognition rather than speed or memorization alone. |  |  |  |
| 1.3 Demonstrates awareness of key learning progressions:  a. In K-6, they build number sense, including:   * Subitizing * Cardinality * Object counting * Verbal counting * Spatial relationships and use of * Benchmark numbers (e.g., 5 and 10) * Part–part–whole reasoning   b. In 6-12, that builds number and algebraic reasoning, including:   * Rational Numbers * Proportional Relationships * Expressions and Equations * Functions * Structure of the Real Number System |  |  |  |

## Domain 2: Instructional Practices for Diverse Learners – “The Who”

| **Criteria and Key Performance Area** | **Curriculum Written Evaluation and Evidence for Performance Indicators of Candidate Competency** | **Files** | **Self-Rating (based on rubrics in Workbook section 2)** |
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| 2.1 Understands and responds to students’ culture, language, identity, learner differences, and lived experiences that shape their mathematical thinking. |  |  |  |
| 2.2 Integrates developmentally appropriate, evidence-based supports for students with disabilities and those identified as needing intervention in mathematics. |  |  |  |
| 2.3 Demonstrates a commitment to high expectations for all students. |  |  |  |

## Domain 3: Structured Mathematics Instruction – “The How”

| **Criteria and Key Performance Area** | **Curriculum Written Evaluation and Evidence for Performance Indicators of Candidate Competency** | **Files** | **Self-Rating (based on rubrics in Workbook section 2)** |
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| 3.1 Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates these goals within learning progressions, and uses them to guide instructional decisions. |  |  |  |
| 3.2 Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem-solving, allowing multiple entry points and varied solution strategies. |  |  |  |
| 3.3 Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen their understanding of mathematical concepts and procedures, and as tools for problem-solving. |  |  |  |
| 3.4 Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students, enabling them to build a shared understanding of mathematical ideas by analyzing and comparing their approaches and arguments. |  |  |  |
| 3.5 Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students’ reasoning and sense-making about important mathematical ideas and relationships. |  |  |  |
| 3.6 Build procedural fluency from conceptual understanding. Effective teaching of mathematics fosters fluency with procedures on a foundation of conceptual understanding, enabling students to become skillful in using procedures flexibly as they solve contextual and mathematical problems over time. |  |  |  |
| 3.7 Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships. |  |  |  |
| 3.8 Elicit and use evidence of student thinking. Effective teaching of mathematics utilizes evidence of student thinking to assess progress toward mathematical understanding and continually adjust instruction in ways that support and extend learning. |  |  |  |

## Domain 4: Structured Mathematics Instruction – “The What”

| **Criteria and Key Performance Area** | **Curriculum Written Evaluation and Evidence for Performance Indicators of Candidate Competency** | **Files** | **Self-Rating (based on rubrics in Workbook section 2)** |
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| 4.1 Uses learning and developmental progressions across K–12 to design instruction that is responsive to how students build understanding of specific mathematical ideas. This includes foundational concepts such as number sense and operations in early grades, as well as algebraic thinking, functions, and modeling in secondary grades (e.g., Carpenter; Clements & Sarama; Van de Walle; NCTM; AMTE). |  |  |  |
| 4.2 Builds procedural fluency through flexible strategy use, guiding students to select, apply, and justify efficient strategies after developing conceptual understanding, prioritizing reasoning over memorization. |  |  |  |
| 4.3 Anticipates and addresses common misconceptions by analyzing students’ reasoning to identify developmental stages and inform instructional decisions that support learning. |  |  |  |

## Domain 5: Assessment Practices in Mathematics

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| **Criteria and Key Performance Area** | **Curriculum Written Evaluation and Evidence for Performance Indicators of Candidate Competency** | **Files** | **Self-Rating (based on rubrics in Workbook section 2)** |
| 5.1 Selects and appropriately uses a range of assessment types, such as formative and summative, to support instructional decisions and student learning. |  |  |  |
| 5.2 Analyzes student work and performance-based assessments to determine appropriate next steps—providing feedback that supports conceptual development and extends learning. |  |  |  |
| 5.3 Supports student progress within a Multi-Tiered System of Supports (MTSS) framework using assessment data to inform instructional goals. |  |  |  |