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| **Assurance of Student Learning Report**  **2022-2023** | | |
| College of Education and Behavioral Sciences | | School of Teacher Education |
| Elementary Math Specialist Certificate (0485) | | |
| Sue Keesey, Director | | |
| ***Is this an online program***?  Yes  No | Please make sure the Program Learning Outcomes listed match those in CourseLeaf . Indicate verification here  Yes, they match! (If they don’t match, explain on this page under **Assessment Cycle)** | |

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| ***Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages. Add more Outcomes as needed.*** | | | |
| **Program Student Learning Outcome 1:**  **Demonstrate content knowledge for teaching mathematics:** a. Demonstrate deep understanding of mathematics for grades P-5 with a consideration of how students progress beyond elementary school to middle grades mathematics in the following areas: Number and Operations; Algebra and Functions; Geometry and Measurement; Data Analysis and Probability. b. Develop further specialized mathematics knowledge for teaching. Create opportunities for learners to develop, apply, and critically evaluate their selection and use of these practices. Diagnose mathematical misconceptions and/or errors as well as design appropriate interventions. Choose and/or design tasks to support the learning of new mathematical ideas or methods, or to test learners’ understanding of them. | | | |
| **Instrument 1** | **Math and Technology Growth Plan: Assessment (Key Assessment)--** Strengths and Growth Areas portions | | |
| **Instrument 2** | **Math Lesson Plan Redesign: Assessment** | | |
| **Instrument 3** | **N/A** | | |
| **Based on your results, check whether the program met the goal Student Learning Outcome 1.** | | **Met** | **Not Met** |
| **Program Student Learning Outcome 2:**  **Demonstrate pedagogical knowledge for teaching mathematics:** a. Demonstrate understanding of learners and learning. Utilize and build upon learners’ existing knowledge, skills, understandings, conceptions and misconceptions to advance learning. Create social learning contexts that engage learners in discussions and mathematical explorations among peers to motivate and extend learning opportunities. b. Demonstrate expertise of teaching. Design, select and/or adapt worthwhile mathematics tasks and sequences of examples that support a particular learning goal. Use questions to effectively probe mathematical understanding and make productive use of responses. Model effective problem solving and mathematical practices—questioning, representing, communicating, conjecturing, making connections, reasoning and proving, self-monitoring and cultivate the development of such practices in learners. Analyze and evaluate student ideas and work, and design appropriate responses. Develop skillful and flexible use of different instructional formats—whole group, small group, partner, and individual—in support of learning goals. Manage diversities of the classroom and school—cultural, disability, linguistic, gender, socio-economic, developmental—and use appropriate strategies to support mathematical learning of all students. c. Demonstrate skills in designing and implementing curriculum and assessment. Use learning trajectories related to mathematical topics and apply this knowledge to sequence activities and design instructional tasks. Know the different formats, purposes, uses, and limitations of various types of assessment of student learning; be able to choose, design, and/or adapt assessment tasks for monitoring student learning. Use the formative assessment cycle and be able to find or create appropriate resources for this purpose. | | | |
| **Instrument 1** | **Math and Technology Growth Plan: Diverse Learners (Key Assessment)--** Strengths and Growth Areas portions | | |
| **Instrument 2** | **Differentiated CREATE Math Lesson Plan (Key Assessment)** | | |
| **Instrument 3** | **Math Coaching: Instruction** | | |
| **Based on your results, check whether the program met the goal Student Learning Outcome 2.** | | **Met** | **Not Met** |
| **Program Student Learning Outcome 3:**  **Apply leadership knowledge and skills:**   * Plan, develop, implement, and evaluate professional development programs at the school and district level and support teachers in systematically reflecting and learning from practice. * Use leadership skills to improve mathematics programs at the school and district levels. | | | |
| **Instrument 1** | **Math and Technology Growth Plan: Leadership (Key Assessment)** | | |
| **Instrument 2** | **Math Coaching Interview, Part I: Leadership (Key Assessment)** | | |
| **Instrument 3** | **Math Coaching Interview, Part II: Leadership (Key Assessment)** | | |
| **Based on your results, check whether the program met the goal Student Learning Outcome 3.** | | **Met** | **Not Met** |
| **Assessment Cycle Plan:** | | | |
| For the 2022-2023 cycle, all of these assessments were in place and will be for the 2023-2024 school year. | | | |

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| **Program Student Learning Outcome 1** | | | | | | | |
| **Program Student Learning Outcome** | **Demonstrate content knowledge for teaching mathematics:** a. Demonstrate deep understanding of mathematics for grades P-5 with a consideration of how students progress beyond elementary school to middle grades mathematics in the following areas: Number and Operations; Algebra and Functions; Geometry and Measurement; Data Analysis and Probability. b. Develop further specialized mathematics knowledge for teaching. Create opportunities for learners to develop, apply, and critically evaluate their selection and use of these practices. Diagnose mathematical misconceptions and/or errors as well as design appropriate interventions. Choose and/or design tasks to support the learning of new mathematical ideas or methods, or to test learners’ understanding of them. | | | | | | |
| **Measurement Instrument 1** | **Math and Technology Growth Plan: Assessment (Key Assessment)--** Strengths and Growth Areas portions | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Assessment (Key Assessment) will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are: Professional StrengthsAreas for Professional GrowthActions for Professional GrowthImpact of Professional Growth | | | | | | |
| **Program Success Target for this Measurement** | | | 80% scoring a 3 of 4 points on each of four rubric categories | | **Percent of Program Achieving Target** | **MET:**  **89% of students mastered each indicator with a 3 or 4 of 4 points, and 4 of the 4 indicators showed scores at or above a 3 of 4 for 80% or more the the student population.** | |
| **Methods** | This data is collected each year as part of ELED 573. Faculty evaluated this assignment, which requires participants to reflect on the mathematics teaching lens of assessment to determine their professional strengths and areas of growth and actions and impact of professional growth. | | | | | | |
| **Measurement Instrument 2** | **Math Lesson Plan Redesign: Assessment** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math Lesson Plan Redesign (Key Assessment) will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are:   * Coaching a peer (or Self-Review of Assessment) * Assessment Redesign: Consider Multiple Methods and Engagement, Progress Monitoring, and Impact on Student Learning * Data Collection, Analysis, and Reflection * Assessment Cycle Includes Added Technology | | | | | | |
| **Program Success Target for this Measurement** | | 80% scoring a 3 of 4 points on each of four rubric categories | | **Percent of Program Achieving Target** | | **MET:**  **100% of students mastered each indicators, and 4 of the 4 indicators showed scores or above a 3 of 4 for 80% or more the the student population.** | |
| **Methods** | This data is collected each year as part of ELED 573. Faculty evaluated this assignment, which requires students work with a colleague at their school and redesign an assessment. They must reflect on the original assessment within a lesson plan and justify decisions of improvement. | | | | | | |
| **Measurement Instrument 3** | **N/A** | | | | | | |
| **Criteria for Student Success** | **N/A** | | | | | | |
| **Program Success Target for this Measurement** | | **N/A** | | **Percent of Program Achieving Target** | | **N/A** | |
| **Methods** | **N/A** | | | | | | |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | | | | | | **Met** | **Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** | | | | | | | |
| Results:  The high performance rate on these assessments was expected.  Conclusions:  The application of these assessments is a valued part of the participants in the course. They appreciate the opportunity to apply their learning to their professional setting.  Plans for Next Assessment Cycle:  I want to change how I frame the “Impact of Professional Growth” indicator in the Growth Plan rubric as this is a future thinking rather than what the participants can write up in their reflection. | | | | | | | |

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| **Program Student Learning Outcome 2** | | | | | | | |
| **Program Student Learning Outcome** | **Demonstrate pedagogical knowledge for teaching mathematics:** a. Demonstrate understanding of learners and learning. Utilize and build upon learners’ existing knowledge, skills, understandings, conceptions and misconceptions to advance learning. Create social learning contexts that engage learners in discussions and mathematical explorations among peers to motivate and extend learning opportunities. b. Demonstrate expertise of teaching. Design, select and/or adapt worthwhile mathematics tasks and sequences of examples that support a particular learning goal. Use questions to effectively probe mathematical understanding and make productive use of responses. Model effective problem solving and mathematical practices—questioning, representing, communicating, conjecturing, making connections, reasoning and proving, self-monitoring and cultivate the development of such practices in learners. Analyze and evaluate student ideas and work, and design appropriate responses. Develop skillful and flexible use of different instructional formats—whole group, small group, partner, and individual—in support of learning goals. Manage diversities of the classroom and school—cultural, disability, linguistic, gender, socio-economic, developmental—and use appropriate strategies to support mathematical learning of all students. c. Demonstrate skills in designing and implementing curriculum and assessment. Use learning trajectories related to mathematical topics and apply this knowledge to sequence activities and design instructional tasks. Know the different formats, purposes, uses, and limitations of various types of assessment of student learning; be able to choose, design, and/or adapt assessment tasks for monitoring student learning. Use the formative assessment cycle and be able to find or create appropriate resources for this purpose. | | | | | | |
| **Measurement Instrument 1** | **Math and Technology Growth Plan: Diverse Learners (Key Assessment)--** Strengths and Growth Areas portions | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Instruction for Diverse Learners (Key Assessment) will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are: Professional StrengthsAreas for Professional GrowthActions for Professional GrowthImpact of Professional Growth | | | | | | |
| **Program Success Target for this Measurement** | | | 80% scoring a 3 of 4 points on each of four rubric categories. | | **Percent of Program Achieving Target** | **MET:**  **89% of students mastered each indicator with a 3 or 4 of 4 points, and 4 of the 4 indicators showed scores at or above a 3 of 4 for 80% or more the the student population.** | |
| **Methods** | This data is collected each year as part of ELED 572. Faculty evaluated this assignment, which requires participants to reflect on the mathematics teaching lens of instruction for diverse learners to determine their professional strengths and areas of growth and actions and impact of professional growth. | | | | | | |
| **Measurement Instrument 2** | **Differentiated CREATE Math Lesson Plan (Key Assessment)** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Instruction for Diverse Learners (Key Assessment) will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are:   * Goals, Objectives and Connections * Context * Instruction and Resources * References * Impact * Refinement | | | | | | |
| **Program Success Target for this Measurement** | | 80% scoring a 3 of 4 points on each of four rubric categories. | | **Percent of Program Achieving Target** | | **NOT MET:**  **67% on the “References” indicator and 78% on the “Refinement” indicator scored at scored at 3 of 4 or above on the rubric.**  **89-100% of students mastered 4 of 6 indicators with a 3 or 4 of 4 points.** | |
| **Methods** | This data is collected each year as part of ELED 572. Faculty evaluated this assignment, which requires participants to design a differentiated lesson plan that is cognitively complex, real world, engaging, and incorporates technology. | | | | | | |
| **Measurement Instrument 3** | **Math Coaching: Instruction** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math Coadhing: Instruction (Key Assessment) will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are:   * Math Coaching: Instruction with Questioning and Discourse * Differentiating Instruction for All Learners * Coaching to support emergent multilingual and/or special needs students * Design Website to Show Coaching Summary | | | | | | |
| **Program Success Target for this Measurement** | | 80% scoring a 3 of 4 points on each of four rubric categories. | | **Percent of Program Achieving Target** | | **NOT MET:**  **78% on the “Design Website to Show Coaching Summary” indicator scored at scored at 3 of 4 or above on the rubric.**  **89% of students mastered 3 of 4 indicators with a 3 or 4 of 4 points.** | |
| **Methods** | This data is collected each year as part of ELED 572. Faculty evaluated this assignment, which requires participants to interview a colleague in the school setting, practicing coaching skills to improve questioning and discourse, differentiaions, and support of special needs students. | | | | | | |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.** | | | | | | **Met** | **Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** | | | | | | | |
| Results:  I had expected the participants to have mastery with all indicators with a score of 3 of 4 or above on the rubrics. I find that my participants are trying to survive right now and are not as interested in the grade.  Conclusions:  The application of these assessments is a valued part of the participants in the course – they especially love learning how to coach a colleague in mathematics instruciton. They appreciate the opportunity to apply their learning to their professional setting.  Plans for Next Assessment Cycle:  I want to emphasize the importance of all pieces of the rubric and provide anchor examples and video explanation for the assignments. | | | | | | | |

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| **Program Student Learning Outcome 3** | | | | | | | |
| **Program Student Learning Outcome** | **Apply leadership knowledge and skills:**   * Plan, develop, implement, and evaluate professional development programs at the school and district level and support teachers in systematically reflecting and learning from practice. * Use leadership skills to improve mathematics programs at the school and district levels. | | | | | | |
| **Measurement Instrument 1** | **Math and Technology Growth Plan: Leadership (Key Assessment)** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Leadership (Key Assessment)  will be no less 80% scoring a 3 of 4 points on each of four rubric categories.  The Content Categories are: Professional StrengthsAreas for Professional GrowthActions for Professional GrowthImpact of Professional Growth | | | | | | |
| **Program Success Target for this Measurement** | | | 80% scoring a 3 of 4 points on each of four rubric categories. | | **Percent of Program Achieving Target** | **NOT MET:**  **78% on the “Actions for Professional Development” and “Impact of Professional Growth” and 67% on the “Professional Strengths” and “Areas for Professional Growth” indicators scored at scored at 3 of 4 or above on the rubric.** | |
| **Methods** | This data is collected each year as part of ELED 571. Faculty evaluated this assignment, which requires participants to reflect on the mathematics teaching lens of leadership to determine their professional strengths and areas of growth and actions and impact of professional growth. | | | | | | |
| **Measurement Instrument 2** | **Math Coaching Interview, Part I: Leadership (Key Assessment)** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Leadership (Key Assessment)  will be no less 80% scoring a 2 of 3 points on each of four rubric categories.  The Content Categories are:   * Summary of Interview, including overview of tools * What you learned about being a coach/leader * What you learned about the teachers’ mathematical thinking * Next steps: what gowth areas to work on * Technology use | | | | | | |
| **Program Success Target for this Measurement** | | 80% scoring a 2 of 3 points on each of four rubric categories. | | **Percent of Program Achieving Target** | | **NOT MET:**  **78% on the “Technology Use” indicator scored at scored at 2 of 3 or above on the rubric.**  **89% scored at 2 of 3 or above on rubric for all other 4 indicators.** | |
| **Methods** | This data is collected each year as part of ELED 571. Faculty evaluated this assignment, which requires participants to interview and coach a colleague in the school setting to work on the skills to improve the colleague’s mathematical thinking and to learn coaching techniques. | | | | | | |
| **Measurement Instrument 3** | **Math Coaching Interview, Part II: Leadership (Key Assessment)** | | | | | | |
| **Criteria for Student Success** | The overall success rate for success rate for all students on the Math and Technology Growth Plan: Leadership (Key Assessment)  will be no less 80% scoring a 2 of 3 points on each of four rubric categories.  The Content Categories are:   * Summary of Interview, including overview of tools * What you learned about being a coach/leader * What you learned about the teachers’ mathematical thinking * Next steps: what gowth areas to work on * Technology use | | | | | | |
| **Program Success Target for this Measurement** | | 80% scoring a 2 of 3 points on each of four rubric categories. | | **Percent of Program Achieving Target** | | **MET:**  **100% scored at 2 of 3 or above on rubric for all other 4 indicators.** | |
| **Methods** | This data is collected each year as part of ELED 571. Faculty evaluated this assignment, which requires participants to interview and coach a colleague in the school setting to work on the skills to improve the colleague’s mathematical thinking and to learn coaching techniques. | | | | | | |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.** | | | | | | **Met** | **Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** | | | | | | | |
| Results:  I had expected the participants to have mastery with all rubrics. I find that my participants are trying to survive right now and are not as interested in the grade.  Conclusions:  The application of these assessments is a valued part of the participants in the course – they especially love learning how to coach a colleague in mathematics instruciton. They appreciate the opportunity to apply their learning to their professional setting.  Plans for Next Assessment Cycle:  I think I need to collapse the Math Coaching Interview to be one big assignment versus two parts. I will think through this and determine whether this might provide more clarity for the participants. | | | | | | | |

**\*\*\* Please include Curriculum Map (below/next page) as part of this document**

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| **Other Services Assessment Area #** | **Performance Assessment Areas -  (Must address practices related to Diversity in all areas)** | **Type or Form of Assessments** An assessment may be listed multiple times if the measures apply to the appropriate areas.  Include the key or signature assessments only, does not need to be a list of all the assessments. | **Timing of Assessment or Transition points** Indicate the point in the program when the assessment is administered. (**Beginning, Middle, End)** |
| **1** | Candidate Knowledge (content), Skills, and Professional Dispositions (integrated practices of diversity) | * **Math and Technology Growth Plan: Leadership (Key Assessment) – Action Plan portion** * **Math and Technology Growth Plan: Diverse Learners (Key Assessment) – Action Plan portion** * **Differentiated CREATE Math Lesson Plan (Key Assessment)** * **Math and Technology Growth Plan: Assessment (Key Assessment) – Action Plan portion** * **Math Lesson Plan Redesign: Assessment (Key Assessment** | Beginning  Mid-point  End |
| **2** | Professional Dispositions | * **Math and Technology Growth Plan: Leadership (Key Assessment)--** Strengths and Growth Areas portions * **Math and Technology Growth Plan: Diverse Learners (Key Assessment)--** Strengths and Growth Areas portions * **Math and Technology Growth Plan: Assessment (Key Assessment)--** Strengths and Growth Areas portions | Beginning  Middle  End |
| **3** | Data and Research driven decision making | * **Math and Technology Growth Plan: Leadership (Key Assessment)** * **Math and Technology Growth Plan: Diverse Learners (Key Assessment)** * **Math and Technology Growth Plan: Assessment (Key Assessment)** | Beginning  Mid-point  End |
| **4** | Integration of Technology in the discipline | * **Math Coaching Interview Part 1: Leadership (Key Assessment)** * **Math Coaching Interview Part 2: Leadership (Key Assessment)** * **Math and Technology Growth Plan: Leadership (Key Assessment)** * **Math Coaching: Instruction (Key Assessment)** * **Differentiated CREATE Math Lesson Plan (Key Assessment)** * **Math and Technology Growth Plan: Diverse Learners (Key Assessment)** * **Math and Technology Growth Plan: Assessment (Key Assessment)** * **Math Lesson Plan Redesign: Assessment (Key Assessment** | Beginning  Middle  End |
| **5** | Clinical Practice (integrated practices of diversity) | * **Math Coaching Interview Part 1: Leadership (Key Assessment)** * **Math Coaching Interview Part 2: Leadership (Key Assessment)** * **Math and Technology Growth Plan: Leadership (Key Assessment)** * **Differentiated CREATE Math Lesson Plan (Key Assessment)** * **Math Coaching: Instruction (Key Assessment)** * **Math and Technology Growth Plan: Diverse Learners (Key Assessment) – Action Plan Portion** * **Lesson Plan Redesign: Assessment (Key Assessment)** * **Math and Technology Growth Plan: Assessment (Key Assessment)** | Beginning  Midpoint  End |

**COURSE EXPERIENCES ADDRESSING KTPS STANDARDS:** The table below delineates the alignment between program courses and the appropriate KTPS standards. For each X under a particular course, reviewers may view a complete description of KTPS-aligned assessments and experiences within the corresponding course syllabus.

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| **Kentucky Teacher Performance Standards (KTPS)** | **Course Standard Alignment** | | | | | | |
| (e.g., ELED 999) | ELED 571 | ELED 572 | ELED 573 | MATH 411G | MATH 507 | MATH 508 |
| Standard 1. Learner development | X |  | X | X |  |  |  |
| Standard 2. Learning differences |  |  | X |  |  |  |  |
| Standard 3. Learning environments: A and B |  | X |  |  |  |  |  |
| Standard 4. Content knowledge: A and B |  |  | X | X | X | X | X |
| Standard 5. Application of content |  |  | X | X | X | X | X |
| Standard 6. Assessment |  |  |  | X |  |  |  |
| Standard 7. Planning for instruction |  |  | X |  |  |  |  |
| Standard 8. Instructional strategies |  | X |  |  |  |  |  |
| Standard 9. Professional learning and ethical practice |  | X |  |  |  |  |  |
| Standard 10. Leadership and collaboration: A, B, C |  | X |  |  |  |  |  |

**COURSE EXPERIENCES ADDRESSING LEARNED SOCIETY (SPA) STANDARDS:** The table below delineates the alignment between program courses and the appropriate SPA standards. For each X under a particular course, reviewers may view a complete description of SPA-aligned assessments and experiences within the corresponding course syllabus.

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| **NCTM CAEP Standards 2012 Elementary Math Standards** | **Course Alignment** | | | | | |
| ELED 571 | ELED 572 | ELED 573 | MATH 411G | MATH 507 | MATH 508 |
| **Standard 1: Content Knowledge**  Effective elementary mathematics specialists demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, connections, and applications within and among mathematical content domains. Elementary mathematics specialist candidates:   * **1a)**Demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, applications in varied contexts, and connections within and among mathematical domains (Number and Operations, Algebra, Geometry and Measurement, and Statistics and Probability) as outlined in the NCTM CAEP Mathematics Content for Elementary Mathematics Specialist. |  |  |  | X  1a | X  1a | X  1a |
| **Standard 2: Mathematical Practices**  Effective elementary mathematics specialists solve problems, represent mathematical ideas, reason, prove, use mathematical models, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. They understand that these practices intersect with mathematical content and that understanding relies on the ability to demonstrate these practices within and among mathematical domains and in their teaching and mathematics leadership.  In their role as teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:   * **2a)** Use problem solving to develop conceptual understanding, make sense of a wide variety of problems and persevere in solving them, apply and adapt a variety of strategies in solving problems confronted within the field of mathematics and other contexts, and formulate and test conjectures in order to frame generalizations. * **2b)** Reason abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others; represent and model generalizations using mathematics; recognize structure and express regularity in patterns of mathematical reasoning; use multiple representations to model and describe mathematics; and utilize appropriate mathematical vocabulary and symbols to communicate mathematical ideas to others. * **2c)** Formulate, represent, analyze, and interpret mathematical models derived from real-world contexts or mathematical problems. * **2d)** Organize mathematical thinking and use the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences. * **2e)** Demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts. * **2f)** Model how the development of mathematical understanding within and among mathematical domains intersects with the mathematical practices of problem solving, reasoning, communicating, connecting, and representing. |  |  |  | X  2a,b, c,d,e,f | X  2a,b,d,f | X  2a,b,d,f |
| **Standard 3: Content Pedagogy**  Effective elementary mathematics specialists apply knowledge of curriculum standards for mathematics and their relationship to student learning within and across mathematical domains in teaching elementary students and coaching/mentoring elementary classroom teachers. They incorporate research-based mathematical experiences and include multiple instructional strategies and mathematics-specific technological tools in their teaching and coaching/mentoring to develop all students’ mathematical understanding and proficiency. As teacher, lead teacher, and coach/mentor, they provide and assist teachers in providing students with opportunities to do mathematics – talking about it and connecting it to both theoretical and real-world contexts. They plan, select, implement, interpret, and assist teachers in the incorporation of formative and summative assessments for monitoring student learning, measuring student mathematical understanding, and informing practice.  In their role as teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:   * **3a)** Apply knowledge of curriculum standards for elementary mathematics and their relationship to student learning within and across mathematical domains in teaching elementary students and coaching/mentoring elementary classroom teachers. * **3b)** Analyze and consider research in planning for and leading students and the teachers they coach/mentor in rich mathematical learning experiences. * **3c)** Plan and assist others in planning lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students’ conceptual understanding and procedural proficiency. * **3d)** Provide students and teachers with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace. * **3e)** Implement and promote techniques related to student engagement and communication including selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions, and employing a range of questioning strategies. * **3f)** Plan, select, implement, interpret, and assist teachers in using formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.  3g) Monitor students’ progress and assist others, including family members, administrators and other stakeholders, in making instructional decisions and in measuring and interpreting students’ mathematical understanding and ability using formative and summative assessments. | X  3a,b,d | X  3a,b,c,e | X  3f,g |  |  |  |
| **Standard 4: Mathematical Learning Environment**  Effective elementary mathematics specialists exhibit knowledge of child, pre-adolescent, and adult learning, development, and behavior. They use this knowledge to plan, create, and assist teachers in planning and creating sequential learning opportunities grounded in mathematics education research where students are actively engaged in the mathematics they are learning and building from prior knowledge and skills. They demonstrate, promote, and assist teachers in demonstrating and promoting a positive disposition toward mathematical practices and learning and exhibit and support the equitable and ethical treatment of and high expectations for all students. They include and assist teachers in embracing culturally relevant perspectives in teaching, in recognizing individual student differences, and in using instructional tools such as manipulatives, digital tools, and virtual resources to enhance student learning, while recognizing the possible limitations of such tools.  In their role as teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:   * **4a)** Exhibit knowledge of child, pre-adolescent, and adult learning, development, and behavior and demonstrate and promote a positive disposition toward mathematical processes and learning. * **4b)** Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences. * **4c)** Incorporate knowledge of individual differences and the cultural and language diversity that exists within classrooms and include and assist teachers in embracing culturally relevant perspectives as a means to motivate and engage students. * **4d)** Demonstrate and encourage equitable and ethical treatment of and high expectations for all students. * **4e)** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software); and make and nurture sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools. | X  4a,c,d | X  4b,e |  |  |  |  |
| **Standard 5: Impact on Student Learning**  Elementary mathematics specialists provide evidence that as a result of their instruction or coaching/mentoring of teachers, elementary students’ conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and application of major mathematics concepts in varied contexts have increased. Elementary mathematics specialists support the continual development of a positive disposition toward mathematics. These mathematics specialists show that new student mathematical knowledge has been created as a consequence of their ability to engage students or coach/mentor teachers in mathematical experiences that are developmentally appropriate, require active engagement, and include mathematics-specific technology in building new knowledge.  In their role as teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:   * **5a)** Verify that elementary students demonstrate conceptual understanding; procedural fluency; the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics; and the application of mathematics in a variety of contexts within major mathematical domains. * **5b)** Engage students and coach/mentor teachers in using developmentally appropriate mathematical activities and investigations that require active engagement and include mathematics-specific technology in building new knowledge. * **5c)** Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students’ mathematical proficiencies have increased as a result of their instruction or their efforts in coaching/mentoring teachers. |  | X  5b | X  5a,c |  |  |  |
| **Standard 6: Professional Knowledge and Skills**  Effective elementary mathematics specialists are lifelong learners and recognize that learning is often collaborative. They participate in and plan mathematics-focused professional development experiences at the school and/or district level, draw upon mathematics education research to inform their practice and the practice of colleagues, continuously reflect on their practice, use and assist teachers in using resources from professional mathematics organizations, and demonstrate mathematics-focused instructional leadership.  In their role as teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:   * **6a)** Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics and to their development as a mathematics instructional leader. * **6b)** Engage in and facilitate continuous and collaborative learning that draws upon research in mathematics education to inform practice; enhance learning opportunities for all students’ and teachers’ mathematical knowledge development; involve colleagues and other school professionals, families, and various stakeholders; and advance the development in themselves and others as reflective practitioners. * **6c)** Plan, develop, implement, and evaluate mathematics-focused professional development programs at the school and/or district level; use and assist teachers in using resources from professional mathematics education organizations such as teacher/leader discussion groups, teacher networks, and print, digital, and virtual resources/collections; and support teachers in systematically reflecting on and learning from their mathematical practice. * **6d)** Demonstrate mathematics-focused instructional leadership through actions such as coaching/mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students’ equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps; developing appropriate classroom or school-level learning environments; and collaborating with school-based professionals to develop evidence-based interventions for high and low-achieving students. | X  6a, b, c, d |  |  |  |  |  |
| **Standard 7: Elementary Mathematics Specialist Field Experiences and Clinical Practice**  Elementary mathematics specialists engage in a planned sequence of field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator. They develop a broad experiential base of knowledge and skills working with a range of student and adult learners including elementary students (e.g., primary, intermediate, struggling, gifted, and English language learners) and elementary school teachers, both novice and experienced, in a variety of school and professional development settings. They develop and use interpersonal and leadership skills to engage school-based and other professionals in the improvement of mathematics programs at the school and/or district levels.  Elementary mathematics specialist candidates:   * **7a)** Engage in a sequence of planned field experiences and clinical practice under the supervision of an experienced and highly qualified mathematics educator that involves the development of a broad experiential base of knowledge and skills working with a range of student and adult learners in a variety of school and professional development settings and the development of interpersonal skills critical for mentoring other teachers and working with school-based personnel, district administrators, and others. * **7b)** Develop and use leadership skills to improve mathematics programs at the school and/or district level, e.g., coaching/mentoring new and experienced teachers to better serve students; sharing critical issues, policy initiatives, and curriculum trends related to mathematics teaching; keeping abreast of local, state, or national policy decisions related to mathematics education; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision and to develop an action plan for school improvement; and partnering with school-based professionals to improve each student’s achievement. | X  7a, b | X  7a, b | X  7a, b |  |  |  |

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| **AMTE EMS Standards (2013)** | ELED 571 | ELED 572 | ELED 573 | Math 507 | Math 508 | Math 411G |
| 1. Content Knowledge for Teaching Mathematics   a. Deep understanding of mathematics in grades K–8.  b. Specialized mathematics knowledge for teaching |  | 1.b.1 | 1.b.3-6 | All of I.a | All of I.a | Alg. And Func. 3  Data Analysis and Prob. 1  1.b.2 |
| 1. Pedagogical Knowledge for Teaching Mathematics 2. Learners and Learning 3. Teaching 4. Curriculum and Assessment |  | 2.a.1-3,  2.b.1, 5, 7, 9-10  2.c.1, 3-5 | 2.b.3-4  2.c.2, 6-8 |  |  | 2.a.4  2.b.2,6,8 |
| 1. Leadership Knowledge and Skills | 3.1-6 |  |  |  |  |  |

**RUBRICS & ALIGNMENT:**

**Course Assignments, Projects, and Evaluation: Alignment to Standards**

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| **ELED 571: Major Course Experiences** | **Course Objectives** | **Graduate Program Student Learning Outcomes (SLOs)** | **SPA Standard(s):**  [**NCTM/CAEP Elementary Math Specialist**](https://www.nctm.org/uploadedFiles/Standards_and_Positions/CAEP_Standards/NCTM%20CAEP%20Standards%202012%20-%20Elementary%20Mathematics%20Specialist.pdf) | **KY Teacher Performance Standards** |
| **Math Coaching Interview, Part I: Leadership (Key Assessment)**  Clinical; hours 7 | 1 & 2 | 4, 5 | Standards:  2a  4 a, c  7a, b | KTPS Standard 3a, b  KTPS Standard 9  KTPS 10 b, c |
| **Math Coaching Interview, Part II: Leadership (Key Assessment)**  Clinical; hours 7 | 1 & 2 | 4, 5 | Standards:  3 a, b, d  7 a, b | KTPS Standard 3a, b  KTPS Standards 9  KTPS Standard 10 a, b, c |
| Discussion Board and Blog Journals  Clinical; hours 6 | 2 |  | Standards:  2a  3 a, b, d  4 a, c, d  6 a, b, c, d | KTPS Standard 8  KTPS Standard 9  KTPS Standard 10 a, b, c |
| **Math and Technology Growth Plan: Leadership (Key Assessment)**  Clinical; hours 4 | 3 | 1,2,3,4,5 | Standards:  2a  3 a, b, d  4 a, c, d  6 a, b, c, d  7 a, b | KTPS Standard 8  KTPS Standard 9  KTPS Standard 10 a, b, c |

**ELED 571 Math Coaching Interview Rubric – Part ONE and Part TWO: (100 points total) – SAME rubric for PART ONE and for PART TWO**

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| **Points Earned** | **Distinguished**  **Strong self-reflection and ability to use interviews and tools to improve questioning abilities and understanding of teacher’s mathematical thinking** | **Accomplished**  **Developing self-reflection and ability to use interviews and readings to improve questioning abilities and understanding of teacher’s mathematical thinking** | **Developing**  **Building awareness of self-reflection and/or ability to use interviews and/or readings to improve questioning abilities and understanding of teacher’s mathematical thinking** | **Ineffective** |
| *17-20 pts possible for each category* | *12-16 points possible for each category* | *5-11 points possible for each category* | *0-5 points possible for each category* |
| **Summary of Interview, including overview of tools used**  **Points earned:** | -Interview summary is thorough, including quotes from the interview  -Thorough analysis of teacher’s thinking and responses is included | -Interview summary is thorough  -Analysis of teacher’s thinking and responses is included, but limited | -Interview summary is limited  -Little analysis of teacher’s thinking and no relevant responses are included | Missing several components of interview |
| **What you learned about yourself as a coach/leader**  **Points earned:** | -Include 3 aspects of the interview for which you were confident  -You suggest specific ways to strengthen your questioning based on self-analysis of interview  -You recognize your personal strengths in a balanced way | Include 2 of the following:  -Include 3 aspects of the interview for which you were confident  -You suggest specific ways to strengthen your questioning based on self-analysis of interview  -You recognize your personal strengths in a balanced way | Include 1 of the following:  -Include 3 aspects of the interview for which you were confident  -You suggest specific ways to strengthen your questioning based on self-analysis of interview  -You recognize your personal strengths in a balanced way | Did not explain self as a leader |
| **What you learned about the teacher’s mathematical thinking**  **Points earned:** | -You identify and analyze teacher’s understanding of the interview topics  -You support teacher’s understanding, or lack thereof, for the interviewed topics  -Include evidence from interview and from readings | Include 2 of the following:  -You identify and analyze teacher’s understanding of the interview topics  -You support teacher’s understanding, or lack thereof, for the interviewed topics  -Include evidence from interview and from readings | Include 1 of the following:  -You identify and analyze teacher’s understanding of the interview topics  -You support teacher’s understanding, or lack thereof, for the interviewed topics  -Include evidence from interview and from readings | Did not include what was learned about the teacher’s mathematical thinking |
| **Next steps: What growth areas do you plan to work on**  **Points earned:** | -You choose appropriate next steps  -You justify next steps with evidence from teacher interview and readings | -You choose somewhat appropriate next steps  -You justify next steps with evidence from teacher interview or readings or evidence is limited | -Your chosen next step are disconnected from your interview or you have not chosen a next step  -You provide no justification for next step from teacher interview or from readings | Did not include growth areas |
| **Technology Use** | -A multi-media presentation of the content is provided.  -A minimum of two digital tools are used.  -Incorporate a link to a video or website source that could be helpful in working with the teacher in next steps—provide rationale for link.  -Unique digital tools are used in this presentation (not duplicated from other project in the course) | -A multi-media presentation of the content is provided.  -A minimum of two digital tools are used.  -Unique digital tools are used in this presentation (not duplicated from other project in the course) | -A technology presentation of the content is provided.  -A minimum of two digital tools are used. | Did not use technology |

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| **ELED 572: Major Course Experiences** | **Course Objectives** | **Graduate Program Student Learning Outcomes (SLOs)** | **SPA Standard(s):**  [**NCTM/CAEP Elementary Math Specialist**](https://www.nctm.org/uploadedFiles/Standards_and_Positions/CAEP_Standards/NCTM%20CAEP%20Standards%202012%20-%20Elementary%20Mathematics%20Specialist.pdf) | **KY Teacher Performance Standards** |
| **Differentiated CREATE Math Lesson Plan (Key Assessment):**  ☒Clinical; hours 12 | 1, 2, 3 | 1,4,5 | Standards:  2e, 3a, 3b, 3e, 3f, 4e | KTPS Standards: 1, 2, 4a, 4b, 5, 7 |
| **Math Coaching: Instruction (Key Assessment)**  ☒Clinical; hours 6 | 1 | 4,5 | Standards:  3c, 3e, 3f, 4b, 5b, 7a, 7b | KTPS Standards: 5, 7 |
| Discussion Boards & Blog Journals:  ☒Clinical; hours 6 | 1, 2, 3 |  | Standards:  2a, 2e, 3a, 3b, 3c, 3e, 3f, 4b, 4e, 5b, 7a, 7b | KTPS Standards: 1, 2, 4a, 4b, 5, 7 |
| **Math and Technology Growth**  **Plan: Diverse Learners (Key**  **Assessment):**  ☒Clinical; hours 4 | 1, 3 | 1,2,3,4,5 | Standards:  2a, 2e, 3a, 3b, 3c, 3e, 3f, 4b, 4e, 5b, 7a, 7b | KTPS Standards: 1, 2, 4a, 4b, 5, 7 |

**Differentiated CREATE Math Lesson Plan (Key Assessment): (next four pages)**

|  | **Ineffective**  **1. Indicator Not Met; Needs Much Improvement;**  **(0-49% of points)** | **Developing**  **2. Indicator Partially Met; Needs Improvement;**  **(50-74% of points)** | **Accomplished**  **3. Indicator Met; Acceptable; Proficient**  **(75-94% of points)** | **Distinguished**  **4. Exceeds Indicator; Excellent; Distinguished**  **(95-100% of points)** |
| --- | --- | --- | --- | --- |
| **GOALS and OBJECTIVES and CONNECTIONS (25 points)**  KTPS Standards: 1, 2, 4a, 4b, 5, 7  NCTM  Standards:  2e,  3a,  3b, 3e, 3f, 4e | * Goal(s) reflect only the type or the level of learning but not both, are not clearly stated, are not appropriate for the skills or content or * Instructional objectives do not contain all four part (Audience, Behavior, Condition, and Degree) or * Objectives unclear whether they are content or technology * Poor essential question(s) or irrelevant to lesson * No evidence of higher level thinking in the Content objective (Analysis, Evaluation, or Create level of Bloom’s) or incorrect use of verbs or context * Did not use standards from Common Core Math Standards * Did not use standards from KY Program of Studies – Technology Skills * Incorrect identification of Bloom’s Taxonomy level clues | * Some goal(s) reflect both the type and the level of learning with some clarity, are somewhat appropriate for the skills or content or * Only some instructional objectives contain all four part (Audience, Behavior, Condition, and Degree) or may give several sentences for one objective. * Either content or technology objective is missing * Poor essential question(s) * No evidence of higher level thinking in the Content objective (Analysis, Evaluation, or Create level of Bloom’s) by incorrect use of verbs or context clues * Standard from Common Core Math Standards that is not directly correlated with the subject of content objective * No standard from KY Program of Studies – Technology Skills that are directly correlated with technology objective or used incorrect standards * Incorrect identification of Bloom’s Taxonomy level | * Learning goal(s) reflect the appropriate type and level of learning that are appropriate for the skills/ content; * One content objective and one technology objective * Essential question(s) appropriate to topic and grade level * Evidence of higher level thinking in the Content objective (Analysis, Evaluation, or Create level of Bloom’s) by correct use of verbs but context clues may not be clear * 1 standard from Common Core Math Standards that are directly correlated with the subject of content objective * 1 standard from KY Program of Studies – Technology Skills that are directly correlated with technology objective * Correct identification of Bloom’s Taxonomy level | * Learning goal(s) clearly reflect the appropriate type and level of learning that are for the skills/ content; * One content objective and one technology objective * Essential question(s) appropriate to topic and grade level * Clear evidence of higher level thinking in the Content objective (Analyze, Evaluate, or Create level of Bloom’s) *by correct use of verbs and context clues* * Accomplishes all of the above on the first attempt * 2 standards from Common Core Math Standards that are directly correlated with the content objective * 2 or more standards from KY Program of Studies – Technology Skills that are directly correlated with technology objective * Correct identification of Revised Bloom’s Taxonomy level * Accomplishes all of the above on the first attempt |
| **CONTEXT (30 points)**  KTPS Standards:  1, 4a, 4b, 5, 7  NCTM  Standards:  2e,  3a,  3e, | * The lesson plan reflects a CREATE 1 level or higher. * Justification for each CREATE component provides an example from the lesson that represents CREATE 1 or lower * Justification does not use statements from the CREATE framework supporting each component rating * Discussion that addresses one or two of the characteristics listed in the prompt * Incorrect support matching differentiation tactic(s) to diverse learners in your class or no real differentiation tactic discussed | * The lesson plan reflects a CREATE 2 level or lower. * Justification for each CREATE component provides an example from the lesson that represents CREATE 2 or lower * Justification incorrectly uses one statement from the CREATE framework supporting each component rating * Discussion that addresses few of the characteristics listed in the prompt * Incorrect support matching differentiation tactic(s) to diverse learners in your class | * The lesson plan reflects a CREATE 3 level or higher but the discussion is not comprehensive. * Justification for each CREATE component provides some supporting examples from the lesson * Justification uses one statement from the CREATE framework supporting each component rating * Discussion that addresses most of the characteristics listed in the prompt * Supports match of differentiation tactic(s) to diverse learners in your class | * The lesson plan clearly reflects a CREATE 3 level or higher. * Comprehensive justification for each CREATE component provides clear supporting examples from the lesson * Comprehensive justification uses statements from the CREATE framework supporting each component rating * Comprehensive discussion that addresses each of the characteristics listed in the prompt * Clear, seamless, supportive match of differentiation tactic(s) to diverse learners in your class * Accomplishes all of the above on the first attempt |
| **INSTRUCTION and RESOURCES (55 points)**  KTPS Standards:  1, 2, 4a, 4b, 5, 7  NCTM  Standards:  2e,  3a,  3e,  4e | * <75 word description of all learning activities *for each objective*. * Instructional activities do not connect objectives, assessment, pupil characteristics, identified standards, correct CREATE levels or some of these areas are missing * Differentiations for diverse students is not described at all. * Discussion provides no evidence of pupils using higher level thinking (Analyze, Evaluate, or Create) with the *content* using questions and/or additional criteria. * Pupils do not create a technology product All specific print/media/ technology is not listed. * No instructional documents, activity sheets and assessments are listed or provided in the Appendix. * No description for each resource telling how this resource is used in the lesson. * No additional technologies are used by the teacher to enhance instruction. | * 75-125 word description of all learning activities *for each objective*. * Instructional activities do not clearly connect objectives, assessment, pupil characteristics, identified standards, correct CREATE levels. * Differentiations for diverse students are not clearly described. * Discussion provides little evidence of pupils using higher level thinking (Analyze, Evaluate, or Create) with the *content* using questions and/or additional criteria. * Pupils do not create technology product that meets lesson requirements. All specific print/media/ technology is listed. * Not all instructional documents, activity sheets and assessments are listed and are provided in the Appendix. * 1 sentence description for each resource telling how this resource is used in the lesson. * No additional technologies are used by the teacher to enhance instruction. | * 125-200 word description of all learning activities *for each objective*. * Instructional activities that connect objectives, assessment, pupil characteristics, identified standards, correct CREATE levels. * Differentiations for diverse students are described. * Discussion provides some evidence of pupils using higher level thinking (Analyze, Evaluate, or Create) with the *content* using questions and/or additional criteria. * Pupils create 1 technology product that meets lesson requirements. All specific print/media/ technology is listed. * All instructional documents, activity sheets and assessments are listed and are provided in the Appendix. * 2 sentence description for each resource telling how this resource is used in the lesson. * 1 additional technologies are used by the teacher to enhance instruction. | * 200+ word comprehensive, description of all learning activities *for each objective*. * Instructional activities that clearly connect objectives, assessment, pupil characteristics, identified standards, correct CREATE levels. * Differentiations for diverse students are clearly described. * Discussion provides clear evidence of pupils using higher level thinking (Analyze, Evaluate, or Create) with the *content* using questions and/or additional criteria. * Pupils create 1-2 technology products that meet or exceed lesson requirements. All specific print/media/ technology is listed. * All instructional documents, activity sheets and assessments are listed and are provided in the Appendix. * 2-3 sentence description for each resource telling how this resource is used in the lesson. * 1-2 additional technologies are used by the teacher to enhance instruction. * Accomplishes all of the above on the first attempt |
| **REFERENCES (10 points)** | * Listed at least two references, used APA format with many errors; * No annotations or give very little detail of source contents and how source was used in creating lesson * Very few citations | * Listed at least three references, used APA format with some errors; * Annotations give little detail of source contents and how source was used in creating lesson * Not all “borrowed” information was cited or incorrect APA format | * Listed five references, used correct APA format with few errors; * Annotations give detail of source contents and how source was used in creating lesson * All “borrowed” information cited in correct APA format with 1-2 mistakes | * Listed more than five references, used correct APA format; * Annotations give two sentences—one gives the source’s contents and the second tells how the source was used in creating lesson. * All “borrowed” information (even pictures, rubrics, differentiation tactics) are cited in correct APA format. * Accomplishes all of the above on the first attempt |
| **IMPACT**  **(25 points)**  KTPS Standards:  1, 2, 7  NCTM  Standards:  3b,  3f | Three of the five items is complete:   * Described pupil performance/behavior that required a change giving details about the objective and how the change would improve the learning * Analysis of learning is done at a formal level gathered from the instructional observation citing 2 examples of learning or lack thereof * Cite the differentiation tactic and the student performance with evidence of their response * Formative observations are detailed and include at least 2 examples * Differences in pupil achievement during instruction is documented and 2 examples are included | Four of the five items is complete:   * Described pupil performance/behavior that required a change giving details about the objective and how the change would improve the learning * Analysis of learning is done at a formal level gathered from the instructional observation citing 2 examples of learning or lack thereof * Cite the differentiation tactic and the student performance with evidence of their response * Formative observations are detailed and include at least 2 examples * Differences in pupil achievement during instruction is documented and 2 examples are included | * Described pupil performance/behavior that required a change giving details about the objective and how the change would improve the learning * Analysis of learning is done at a formal level gathered from the instructional observation citing 2 examples of learning or lack thereof * Cite the differentiation tactic and the student performance with evidence of their response * Formative observations are detailed and include at least 2 examples * Differences in pupil achievement during instruction is documented and 2 examples are included. | * Described pupil performance/behavior that required a change giving details about the objective and how the change would improve the learning * Analysis of learning is done at a formal level gathered from the instructional observation citing 3-5 examples of learning or lack thereof * Cite the differentiation tactic and the student performance with evidence of their response * Formative observations are detailed and include at least 3-5 examples * Differences in pupil achievement during instruction is documented and 3-5 examples are included. |
| **REFINEMENT**  **(25 points)**  KTPS Standards:  1, 2, 4a, 4b, 5, 7  NCTM  Standards:  3b, 3f, 4e | 2 of the following 4 items are complete:   * A plan is included for differentiated and/or intervention instruction * A change is included for the differentiation tactic. * A suggestion is given for increasing the CReaTE levels of the lesson. * A suggestion is given for improving the differentiation tactic(s) choice | 3 of the following 4 items are complete:   * A plan is included for differentiated and/or intervention instruction * A change is included for the differentiation tactic. * A suggestion is given for increasing the CReaTE levels of the lesson. * A suggestion is given for improving the differentiation tactic(s) choice | * 2 Plans are included for differentiated and/or intervention instruction * 2 Changes are included for the differentiation tactic. * 2 Suggestions are given for increasing the CReaTE levels of the lesson. * 2 Suggestions are given for improving the differentiation tactic(s) choice | * 3 Plans are included for differentiated and/or intervention instruction * 3 Changes are included for the differentiation tactic. * 3 Suggestions are given for increasing the CReaTE levels of the lesson. * 3 Suggestions are given for improving the differentiation tactic(s) choice |

**Math Coaching: Instruction (Key Assessment) Rubric**

|  | Levels of Achievement | | | |
| --- | --- | --- | --- | --- |
| **Criteria** | **Ineffective** | **Developing** | **Proficient** | **Distinguished** |
| **“Math Coaching: Instruction”, “Questioning and Discourse” NCTM 3c, 3e; KTPS 5 [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_167013_1&panelId=agn&entityId=_2182250_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50762_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  Only one portion of proficient addressed | **75.00 %**  Missing one part of proficient | **90.00 %**  Plan and assist others in planning lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students’ conceptual understanding and procedural proficiency. Implement and promote techniques related to student engagement and communication including selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions, and employing a range of questioning strategies. Application of content. The teacher shall understand how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues. | **100.00 %**  All parts of proficient; included on website/tech tool |
| **“Differentiating Instruction for All Learners” NCTM 4b; KTPS 7 [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_167013_1&panelId=agn&entityId=_2182250_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50762_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  Only one portion of proficient addressed | **75.00 %**  Missing one part of proficient | **90.00 %**  Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences. Planning for instruction. The teacher shall plan instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context. | **100.00 %**  All parts of proficient; included on website/tech tool |
| **"Coaching to support emergent multilingual and/or special needs students" NCTM 5b, 7a, 7b [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_167013_1&panelId=agn&entityId=_2182250_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50762_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  Only one portion of proficient addressed | **75.00 %**  Missing one part of proficient | **90.00 %**  Engage teachers in using developmentally appropriate mathematical activities and investigations that require active engagement and include mathematics-specific technology in building new knowledge. Engage in a sequence of planned field experiences and clinical practice professional development settings and the development of interpersonal skills critical for mentoring other teachers, district administrators, and others. Develop and use leadership skills to improve mathematics programs -- coaching/mentoring new and experienced teachers to better serve students; communicating to educational constituents about students, curriculum, instruction, and assessment; collaborating to create a shared vision; and partnering with school-based professionals to improve each student’s achievement. | **100.00 %**  All parts of proficient; included on website/tech tool |
| **Design Website to Show Coaching Summary [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_167013_1&panelId=agn&entityId=_2182250_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50762_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  1 of 3 parts are included and summarized on website | **75.00 %**  2 of 3 parts are included and summarized on website | **90.00 %**  All three parts of interview/coaching are included on website. | **100.00 %**  All three parts of interview/coaching are developed and elaborative. Extra multi-media elements are included. |

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| **ELED 573: Major Course Experiences** | **Course Objectives** | **Graduate Program Student Learning Outcomes (SLOs)** | **SPA Standard(s):**  [**NCTM/CAEP Elementary Math Specialist**](https://www.nctm.org/uploadedFiles/Standards_and_Positions/CAEP_Standards/NCTM%20CAEP%20Standards%202012%20-%20Elementary%20Mathematics%20Specialist.pdf) | **KY Teacher Performance Standards** |
| **Math Lesson Plan Redesign: Assessment (Key Assessment):**  ☒Clinical; hours 18 | 1, 3 | 4,5 | Standards:  3f, 3g, 5a, 5a, 5c, 7a, 7b | KTPS Standards:  1, 4a, 4b, 5, 6, 7 |
| Discussion Boards & Blog Journals: Assessment  ☒Clinical; hours 6 | 1, 2, 3 |  | Standards:  3f, 3g, 5a, 5c, 7a, 7b | KTPS Standards:  1, 4a, 4b, 5, 6, 7 |
| Math Assessment Technology: A Critique | 1, 3 |  | Standards:  3g | KTPS Standards:  4a, 4b, 5, 6 |
| **Math and Technology Growth Plan: Assessment**  **(Key Assessment):**  ☒Clinical; hours 4 | 1, 2, 3 | 1,2,3,4,5 | Standards:  3f, 3g, 5a, 5c, 7a, 7b | KTPS Standards:  1, 4a, 4b, 5, 6, 7 |

**Scoring Rubric: Mathematics Lesson Redesign -- Assessment Focus**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Standards** | **Levels** | **Beginning** | **Developing** | **Proficient** | **Distinguished** |
|  | **Points** | 1  (0-49% of points) | 2  (50-74% of points) | 3  (75-94% of points) | 4  (95-100 of points) |
| **Coaching a peer (or Self-Review of Assessment)**  KTPS Standards: 7  CAEP/NCTM Standards: 5a, 7a, 7b | 20 points | Incomplete Coaching session | Missing a component of Proficient:  --Talk with both novice and experienced teachers to develop and use interpersonal and leadership skills to improve the assessment cycle.  --Engage in: coaching/mentoring a new or experienced teacher to better improve the assessment cycle to improve each student’s achievement. | Within the clinical setting, discuss with a peer (or self-assess):   * Talk with both novice and experienced teachers to develop and use interpersonal and leadership skills to improve the assessment cycle. * Engage in: coaching/mentoring a new or experienced teacher to better improve the assessment cycle to improve each student’s achievement. | Engages with a pear for the coaching. Has a follow-up reflection with the teacher for the review of the coaching. |
| **Assessment Redesign: Consider Multiple Methods and Engagement, Progress Monitoring, and Impact on Student Learning**  KTPS Standards: 6  CAEP/NCTM Standards: 3f, 3g, 5c | 50 points | Incomplete lesson redesign | Missing one of the following:  --use multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the educator’s and learner’s decision making.  --Focus on improving elementary students’ conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and application of major mathematics concepts in varied contexts.  Does not include a model for redesgin. | Redesign a Lesson Plan or Unit’s Assessment Cycle with a colleague. Address the following:   * use multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the educator’s and learner’s decision making. * Focus on improving elementary students’ conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and application of major mathematics concepts in varied contexts. * Incorporate a model to show one or more of the following:   + demonstrate conceptual understanding;   + procedural fluency;   + the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics;   + the application of mathematics in a variety of contexts within major mathematical domains. | More than one lesson plan is designed to improve a unit.  Model is original and unique to the coaching and addresses at least three of the components of the model:   * demonstrate conceptual understanding; * procedural fluency; * the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics; * the application of mathematics in a variety of contexts within major mathematical domains. |
| **Data Collection, Analysis, and Reflection**  CAEP/NCTM Standards: 5c | 10  Points | Does not collect, analyze, or reflect on data. | Missing:   * Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence   Determine the extent to which students’ mathematical proficiencies have increased as a result of their instruction or their efforts in coaching/mentoring teachers. | Show mastery in ability to:   * Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence * Determine the extent to which students’ mathematical proficiencies have increased as a result of their instruction or their efforts in coaching/mentoring teachers. | Data analysis is shown visually, analyzed in detail, and reflection is thorough. |
| **Assessment Cycle Includes Added Technology**  KTPS: 6 | 20 points | No technology is used. | One piece of technology is used.  Missing one of the following | * Technology tool(s) are used seamlessly in the assessment cycle and enhance the design of learning about how students are progressing.   Addresses all of the following:   * developmentally appropriateness, active engagement, and include mathematics-specific technology in building new knowledge. | More than one piece of technology is used to design a multi-media product. |

**Math and Technology Growth Plan: USE SAME RUBRIC for all three courses:**

* **ELED 571: Math and Technology Growth Plan: Leadership (Key Assessment)**
* **ELED 572: Math and Technology Growth Plan: Diverse Learners (Key Assessment)**
* **ELED 573: Math and Technology Growth Plan: Assessment (Key Assessment)**

|  | Levels of Achievement | | | |
| --- | --- | --- | --- | --- |
| **Criteria** | **Ineffective** | **Developing** | **Proficient** | **Distinguished** |
| **Professional Strengths: [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_164281_1&panelId=agn&entityId=_2097923_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50080_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  Student shows no evidence of professional strengths for noted indicators for NCTM/CAEP, AMTE and ISTE standards. Student does not articulate strengths well. | **75.00 %**  Student shows little evidence of professional strengths for noted indicators for NCTM/CAEP, AMTE and ISTE standards. Student does not articulate strengths well. | **90.00 %**  Student shows some evidence of professional strengths for noted indicators for NCTM/CAEP, AMTE and ISTE standards. Student articulates strengths well. Description was adequate with less than 100 words for each strength area. | **100.00 %**  Student describes evidence of professional strengths for noted indicators for NCTM/CAEP, AMTE and ISTE standards. Gives the indicator and your description. Student articulates strengths well. Description was comprehensive with more than 100 words for each strength area. |
| **Areas for Professional Growth: [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_164281_1&panelId=agn&entityId=_2097923_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50080_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  Student describes no evidence for areas for professional growth for any of the indicators for the noted NCTM/CAEP, AMTE and ISTE standards. Student does not articulate areas for growth well. | **75.00 %**  Student describes little evidence for areas for professional growth for any of the indicators for the noted NCTM/CAEP, AMTE and ISTE standards. Student does not articulate areas for growth well. | **90.00 %**  Student describes some evidence for areas for professional growth for any of the indicators for the noted NCTM/CAEP, AMTE and ISTE standards. Gives the indicator and description. Student articulates areas for growth well. Description was adequate with less than 100 words for each growth area. | **100.00 %**  Student describes evidence for areas for professional growth for any of the indicators for the noted NCTM/CAEP, AMTE and ISTE standards. Gives the indicator and description. Student articulates areas for growth well. Description was comprehensive with more than 100 words for each growth area. |
| **Actions for Professional Growth: [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_164281_1&panelId=agn&entityId=_2097923_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50080_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  The resources needed are NOT well-written and does not contain information that contributes to the growth and to the student's overall plan. | **75.00 %**  The resources needed are poorly written, containing little information that contributes to the growth and to the student's overall plan. | **90.00 %**  Resources needed are somewhat well-written, containing some information that contributes to the growth and to the student's overall plan. All four actions include at least one main action along with 2-3 details. | **100.00 %**  Resources needed are well-written, containing information that contributes to the growth and to the student's overall plan. All four actions include at least one main action along with details that are multi-dimensional (depth, continuous, assessment component, variety, team-oriented, etc.) |
| **Impact of Professional Growth: [Click for more options](https://wku.blackboard.com/webapps/rubric/do/course/manageRubrics?dispatch=edit&popup=true&course_id=_164281_1&panelId=agn&entityId=_2097923_1&entityType=blackboard.platform.gradebook2.GradableItem&rubricId=_50080_1&mode=onsubmit&globalNavigation=false#contextMenu)**  **Weight 25.00%** | **50.00 %**  The student has not identified and not articulated the impact of the professional growth plan. Includes evidence in the plan of progress in implementing the Actions; will be appropriate to the topic and goals | **75.00 %**  The student has somewhat identified and poorly articulated the impact of the professional growth plan. Includes evidence in the plan of progress in implementing the Actions; will be appropriate to the topic and goals of the plan. | **90.00 %**  The student has somewhat identified and articulated the impact of the professional growth plan. Includes evidence in the plan of progress in implementing the Actions; will be appropriate to the topic and goals of the plan. 2-3 Impact statements are aligned with the Actions. | **100.00 %**  The student has thoroughly identified and articulated the impact of the professional growth plan. Includes evidence in the plan of progress in implementing the Actions; will be appropriate to the topic and goals of the plan. Impact statements are aligned with the Actions; are realistic; are measurable; address every aspect of the Action. |