Contract for Services

Spencer County Schools; Taylorsville, KY

Dr. Robert Thomas; Lexington, KY; Richmond, KY

Fiscal Agent: KVEC – Kentucky Valley Education Cooperative

1 Community College Drive

Jolly Building, Suite 107

Hazard, Kentucky 41701

Duration of contract: October 1, 2012 to September 1, 2013

Amount: $40,000

Dr. Robert Thomas and assignees agree to provide services in support of Mathematics education including, but not necessarily limited to:

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| **Teacher Resources [RT Facilitate]** |
| PLC Attendance Math Teachers [HS and MS Math Teachers] |
| Professional Development [HS and MS Math Teachers] |
| Professional Development Computational Fluency [K-12 ] |
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| **University Resources & Support [RT Facilitate]** |
| Data Collection [RT Facilitate] |
| Data Analysis [RT Facilitate] |
| EKU College Readiness Transitions Initiative\* |
| EKU High School Readiness Transitions Initiative\* |
| EKU Grades 6-12 Programs Transitions Initiative\* |
| EKU Curriculum & Instruction Support Programs\* |
| PLC Support [RT Facilitate] |
| Leadership for Professional Development [RT] |
| Updated Curriculum Maps and Pacing Guides\* |
| Common Assessments aligned to the Updated Curriculum\* |
| \*Includes access to all copyrighted materials and protocols |
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| **Milestones and Deliverables [RT Facilitate]** |
| Interim Reports (Quarterly & Annual) |
| Presentation of Results/Research |
| Final Report |
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| **Draw [Anticipated]** |
| $20,000 – December 2012; $10,000 – February 2013; $10,000 – March 2013 |
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Mathematics Plan

The overarching core concept embedded in this transformation model is meeting the **needs of students and advancing students toward college/career readiness in mathematics.** A rigorous curriculum combined with developmentally appropriate remediation will enable students to advance toward these readiness goals. **Accountability will be evenly and appropriately distributed among students, faculty, administration and parents/guardians.**

The Transformation Model for Mathematics is needs based. Meeting the needs of students and teachers, with rigorous curriculum and standards, and assessment informing instruction are the cornerstones of an effective mathematics teaching and learning program.

Programmatically, there are three components where these cornerstones are embedded: **the framework of the program, the curriculum, and the instructional model.**

The framework consists of **scheduling and placing students in mathematics classes that meet the needs of the students academically.** Placement will be made based upon a variety of measurement indicators including the EPAS [Explore, PLAN, and ACT], and MAP [Measure of Academic Progress, NWEA], with additional teacher input based on teacher recommendation and computational fluency [EKU Diagnostic]. The master schedule for AY 2011/2012 has been amended to include this format. Students measuring below benchmarks will be placed in extra companion RTI mathematics classes to facilitate remediation toward meeting college readiness in mathematics.

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| **Needs-Based Math Placement Matrix** | | | | | | | | | | | |
| **Mathematics Transitions Program** | | | |
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| Minimum ACT Exit Expectation | 24-27 | 24-27 | | 22-24 | 22 | | 19 | | | | RTI | |
| 12-2 | AP Cal | Pre-Calculus | | Transition Math, DE College Algebra, or Pre-Calc | Transition Math, DE College Algebra, or Pre-Calc | | Integrated 4 HS | | | | Alg 2 w/Lab | |
| 12-1 | AP Cal | Pre-Calculus | | Transition Math, DE College Algebra, or Pre-Calc | Career Math, T1/T2 or College Alg | | Integrated 4 HS | | | | Alg 2 w/Lab | |
| 11-2 | Pre-Calculus | Adv Alg 2 | | Alg 2 | Alg 2 | | Integrated 3 HS | | | | Geo-Alg2 w/Lab | |
| 11-1 | Pre-Calculus | Adv Alg 2 | | Alg 2 | Alg 2 | | Integrated 3 HS | | | | Geo w/Lab | |
| 10-2 | Adv Alg 2 | Adv Geo | | Geo | Geo | | Integrated 2 HS | | | | Geo w/Lab | |
| 10-1 | Adv Alg 2 | Adv Geo | | Geo | Geo | | Integrated 2 HS | | | | Geo-Alg 1 w/Lab | |
| 9-2 | Adv Geo | Adv Alg | | Alg 1 | Alg 1 | | Integrated 1 HS | | | | Alg 1 w/Lab | |
| 9-1 | Adv Geo | Adv Alg | | Alg 1 | Alg 1 | | Integrated 1 HS | | | | Alg 1 w/Lab | |
|  |  |  | |  |  | |  | | | |
| 9-1 (9th grade - 1st semester) placement based on review of the | | | | |  | | | | |
| following placement criteria: | | |  | |  |  | | |  | | |
| **Explore** (math index); **ITBS** National %-ile; **Automaticity** (Auto | | | | |  | | | |  | | |
| # missed/time); **MAP/ThinkLink, DOMA; KCCT**; **ThinkLink**; **8th grade math** grade; **Algebra or Geometry grade.** | | | | | | | | | | | |
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| Horizontal movement is encouraged based on review of | | | | | | | |
| placement criteria. | | |  | |  | | |
|  |  | |  | |  | | |
| T1/T2/T3: Transitional Math 1, 2 & 3 | | | | |  | | |
| developmental course in math skills for career-college readiness. | | | | | | | |

This model is either currently in place or being adopted in several counties in Kentucky including: McCreary, Letcher, Lawrence, Estill, Greenup, Carter, Pineville, Casey, Bullitt, Russell Independent, et al. This model is dynamic, with students **encouraged to migrate upwards to tracks that enable different levels of college mathematics readiness.** Student migration will be based on **quarterly, semi-annual, and annual measures of progress** on the indicators previously mentioned. Depending on need, RTI classes will focus on remediation, reinforcement and/or enrichment of students.

**The second leg of the framework for transformation is the curriculum**. The new Kentucky core standards for mathematics have been combined with the ACT college readiness standards to create a set of standards that are rigorous and measurable. Curriculum maps have been created that reflect these standards and teachers have already begun creating instructional maps to accompany the curriculum maps.

**The third leg of the framework for transformation is instruction**. A dynamic teaching model that accommodates the learning styles of 14 to 17 year-old students will be phased in over the duration of this intervention. This teaching model **divides the learning period into segments of usually no more than 10 minutes.** Teachers control the pace of the instruction and students are instructed in time segments corresponding to their optimal learning patterns.

**Professional Development will begin** that addresses the teacher needs in all 3 of the areas listed **and will continue weekly, monthly and annually throughout the duration of the grant and hopefully beyond.**

The Transformation Model will encompass various components of the following Transitions Programs current already initiated near the end of the last academic year in anticipation of full scale implementation:

**K-9 Transition Initiative Pilot Program**

The EKU Math Education Team is working with teachers in over 40 regional schools districts. This Program initiative combines a comprehensive basic skills initiative centered on automaticity, numeracy and mathematics fluency and a comprehensive testing and remediation program. In this pilot program, teachers have been empowered to create grade level end of course skills tests to evaluate individual students for placement and remediation. This ongoing initiative [Year 4] has shown promising results with Phase two [remediation schedules] instituted. The Math Education Team has expanded the program to other selected schools in the EKU service region with similar levels of success. Professional development sessions for schools and districts participating in this initiative have been on going

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**Secondary Transition to College Mathematics Courses**

The EKU Mathematics Education team in the Department of Mathematics and Statistics was tasked to assist regional school districts and high schools in designing and implementing ‘transition to college’ math courses. Meetings were held in late summer of 2009 to develop pilot transition programs at targeted regional schools. The pilot program centered on a framework of content and concepts [T1, T2, and T3, roughly aligned with the Developmental Courses at EKU] that can be adapted to the specific needs and conditions in each high school. **Long-term and sustainable change is best attained when the change is embedded, bottom-up, has input from the local stakeholders and is based on sound research and principles. These curricula contain all of these components.** Teachers in each school are charged with designing instructional plans based on the curricula provided by the EKU Math Education team. EKU Math Education team provided materials such as worksheets, class notes, and measurement instruments (quizzes and tests) for teachers. EKU provided entrée into the KYOTE system for pre/post testing, diagnostics and scores for developmental and non-developmental placement. EKU added components for automaticity/numeracy/math fluency, college readiness, and self-directed learning. The Kentucky Commissioner of Education described this initiative as “A Best Practice in Kentucky Schools”. [KDE 2009]

**K-9 Transition Program Components:**

* Diagnostics: Automaticity/Test Regimens
* Grade Level Tests
* Data Analysis
* Automaticity Remediation
* Algorithmic Facility
* Numeracy/Math Fluency
* Intervention/Remediation/Reinforcement/Enrichment
* K-2 Component

Although **research shows that automaticity and basic skill remediation has a long-term payoff** in measurable results on standardized tests, initial results show that student achievement scores in mathematics are moving upward. In one measure, MAP testing, initial data indicates upward growth in percentile scores [relative position among tested students].

Phase 1: This meeting is to review/reiterate the program’s goals and procedures and to explain and set up the automaticity diagnostic procedures.

Phase 2: This meeting is a PD session to review the diagnostic data and help teachers set up initial remediation regimens. The EKU Math Team will provide resources that include the Automaticity Review sheets, and teachers from districts already familiar with and successfully using these sheets to conduct sessions. Additional discussions will take place concerning other transition options currently in place at the original pilot school.

Phase 3: Individualized remediation with computer assisted programs. Remediation – Reinforcement – Enrichment

**Grades 6-12 Math Programs**

The program contains the following components that are customized to meet the needs of student and faculty:

* Needs based placement [RTI for all ability groups]
* Assessment leading instruction
* Dynamic Teaching Model
* Dynamic needs-based grouping program with flexible options for Students
* Minimum goals of College Readiness. [ACT of 19]
* Additional Level goals of College Algebra Readiness [ACT of 22] and Calculus Readiness [ACT of 27]

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| References:  A National Convocation on Professional Development For Mathematics and Science Teachers, K-12, Horizon Research, Inc., September 2002 [Excerpts]  Elmore, R. F. 2002. Bridging the gap between standards and achievement: The imperative for  professional development in education. Washington, DC: The Albert Shanker Institute.  The Fundamentals of Whole-System Reform, A Case Study From Canada; Michael Fullan & Ben Levin; Education Week; Wednesday, June 17, 2009, Volume 28, Issue 35, pp. 30-31.  Preparing Professional Development Providers: Lessons Learned from a Study of Teacher Leaders, Professional Development Convocation, September 30, 2002,  Sorcinelli, M. D. & Austin, A. E. (2006). Developing faculty for new roles and changing expectations. *Effective Practices for Academic Leaders*, *1 (11)*, 1-16.  Thames, W. (2009). *Senior Year College Readiness Initiative*. Data for project proposal presented  Wilson, S. M. & Berne, J. 1999. Teacher learning and the acquisition of professional knowledge: An examination of research on contemporary professional development. Review of Research in Education Vol. 24, A. Iran-Nejad and P. D. Pearson, Eds.  Woodward, John, Developing Automaticity In Multiplication Facts: Integrating Strategy Instruction With Timed Practice Drills, Learning Disability Quarterly, Vol.29, Fall 2006; p. 269-289 |