

Math **Professional Development**

Campus/District Offerings Serving Region 10 Schools 2010 - 2011

All titles are available on-site and by request as of 07/01/10 to members of the Region 10 Professional Development Cooperative

Elementary Mathematics

Back to the Basics with Whole Number Concepts (K-5)

Number sense is the flexible ways of thinking about numbers and their relationships. This professional development session will help teachers develop the concept of whole number relationships in their classrooms. Teachers will receive hands-on manipulative based instructional strategies to use with their students.

Do I Know What They Know? How to Assess for Understanding in the Mathematics Classroom (K-5, 6-12) *NEW*

In this session educators will develop a common understanding of formative assessment and how it is implemented in the classroom. Focus will be placed on effectively using formative assessment to measure what students think and know throughout the instructional period, not just at the end of a unit of study. Teachers will be able to adjust instruction based on this important feedback from students.

First Steps in Mathematics (K-9)

First Steps in Mathematics professional development will develop and expand teachers' understanding of mathematics and how children learn mathematics. First Steps in Mathematics enables teachers to successfully diagnose, plan, implement, and evaluate their students' learning experiences. Diagnostic Tasks and Diagnostic Maps within each strand will help teachers to identify students' misconceptions about mathematics. Sample lessons and learning activities provide teachers with practical and simple ideas to support students' development.

Got Problems? Use Patterns: Understanding Algebra through Patterns (K-5)

Understanding Algebra begins in Kindergarten and is built upon throughout the grades. Algebra is an essential component to any mathematics curriculum, but is often misrepresented as an abstract and difficult concept for young students to master. Research from the National Council for Teachers of Mathematics suggests that an understanding of patterns helps build algebraic reasoning skills. The session is designed to provide teachers with a deeper understanding of algebraic reasoning. Student-ready activities will be provided as a resource to strengthen understanding of patterns and algebraic reasoning in the elementary classroom.

Ignite Mathematics and Science Instruction in the Elementary Classroom, (K-5)

In order to create a more student centered classroom, teachers need to be equipped with the knowledge and skills to teach math and science in a more meaningful way. This training will provide teachers with instructional strategies that will help assist them to integrate their math and science instruction.

Jazz Up Math with Journaling (K-5, 6-8, 9-12) *NEW*

In this professional development session, teachers will learn journaling strategies and techniques that help ALL students organize their learning, find relevance, and assist in knowledge retention. Included are TEKS-based activities that not only address math content, but also facilitate math process skill building. These strategies will support participants as they develop the expertise necessary to lead every student to math excellence.

Just the Facts: Effective Strategies for Teaching Mathematics Facts (K-2, 3-5) *NEW*

Researchers such as Fuson agree that computational fluency, and the ability to learn, apply, and recall mathematical facts is necessary for students to become efficient mathematical problem solvers. In this professional development session, participants will learn effective strategies for introducing, reinforcing, practicing, extending, and recalling addition, subtraction, multiplication, and division facts.

Learning How to Share: Understanding Fractions in the Elementary Grades (K-5) *NEW*

In this session, participants will recognize the importance of developing understandings over time by experiencing what it means to teach for conceptual understanding with fractions. Participants will learn the value of teaching mathematical ideas in a problem-solving context while using a hands-on approach to fractions.

Using the 5E Model of Instruction to Engage Students in Mathematics (K-5, 6-8, 9-12)

The 5E model was developed for instruction in the Science classroom, but is also an effective instructional model for Mathematics. The Engage Phase creates interest and curiosity through questioning, hands-on activities, videos, audios, guest speakers, etc. Learning continues with Exploration, Explanation, Elaboration, and Evaluation, leading to a depth of understanding of mathematics concepts.

Middle School Mathematics

Are You Ready? You Will Be! Graphing Calculator Strategies for Success on Algebra I EOC Items (8-10) *NEW*

This half-day session will allow participants to examine the last released Algebra I EOC (2002), as well as TAKS items that address the Student Expectations that will be tested as the Algebra I EOC becomes a high-stakes test. For each student expectation, strategies for using the graphing calculator as a tool for multiple representation and problem solving will be examined. Graphing calculators will be provided, but please feel free to bring your own. Graphing calculators are useful tools that can enhance mathematical instruction, foster improved teaching and learning, and increase mathematical achievement (Dunman, 1999)

Do I Know What They Know? How to Assess for Understanding in the Mathematics Classroom (K-5, 6-12) *NEW*

In this session educators will develop a common understanding of formative assessment and how it is implemented in the classroom. Focus will be placed on effectively using formative assessment to measure what students think and know throughout the instructional period, not just at the end of a unit of study. Teachers will be able to adjust instruction based on this important feedback from students.

Do You Know the Way to Abstract? Bridge from the Concrete to the Abstract Level of Understanding Using Manipulatives (6-8) *NEW*

For teaching to be effective in a mathematics classroom, it is necessary to provide focused instruction that moves the student from the concrete to the abstract to the application of the concept (Marzano 2003). The use of manipulatives in the classroom allows teachers to engage students more effectively by addressing different learning styles, and developing understanding that leads to higher-level thinking. This type of instruction also aids in building foundational understanding for struggling students in Tier 1 and tier 2. In fact, as students move through each phase of learning, they are exposed to a concept or skill numerous times. Per research, students should have multiple experiences with topics, allowing them to integrate the topics into their knowledge base (Marzano 2003).

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Lines and Graphs and Tables, Oh My! Introduction to the Graphing Calculator to Enhance Instruction (6-12) *NEW*

The instructional focus of this session will cover building number sense, proportions, clearing lists, setting window features, entering numerical and categorical data into lists, using patterns to discover an equation of a line, writing and evaluating algebraic expressions, function graphing, translations and reflections across the axis's, using Pythagorean theorem, probability experiments, and constructing various types of graphs including box-whisker plots. This session is for beginners to the TI 83/84 graphing calculator. Basic keys and functions of the TI 83/84 graphing calculator will be learned through the application of mathematical concepts that offers an opportunity to engage students and to strengthen mathematical learning. In fact, with proper use, graphing calculator can meet the needs of all students by promoting higher levels of thinking, increase student performance in math, and allowing access to mathematical exploration, experimentation, and enhancement of mathematical concepts (Waits and Pomerantz 1997).

Now I Know What It Is. Show Me Some More! Intermediate Graphing Calculator as a Tool for Teaching Mathematics (6-12) *NEW*

This session is for users of the TI-83/84 graphing calculator with intermediate expertise. Beginning skills/applications will be spiraled in while additional calculator skills are introduced and applied. Content rich activities will be provided to apply learned calculator skills. Dunham found studies that concluded those students who use graphing calculator technology were more active, they participated in more group work, investigations, and problem solving explorations (Dunham, 1993; Dunham & Dick, 1994), and female students improve in confidence, spatial ability, and algebra skills (Dunham 1995)

One Size Does Not Fit All: Specific Strategies for Differentiating Instruction in Mathematics to Meet the Needs of Tier 1 and Tier 2 Students (6-8, 9-12) *NEW*

In most classrooms, students vary widely in readiness, from those who struggle greatly with all or part of a subject to those whose understandings and skills greatly exceed grade-level expectations.

"One-size-fits-all" instruction is not a good fit for the diverse learners in our classrooms. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting each student where he or she is, and assisting in the learning process (Hall, T, 2002). During this staff development session, participants will explore how to differentiate content, instructional strategies, performance tasks, and assessment with their own mathematics lessons.

Rising to the Challenge: Strategies and Content in Middle School Mathematics Based on Campus Data (6-8)

This is a custom designed middle school mathematics staff development session centered on the six mathematical strands that is based on student needs depicted by the campus TAKS, benchmarks, and/or formative assessment data.

TAKS Data Analysis: Strands vs. Focal Points (5-8)

This training will be designed to instruct teachers in curriculum focal points that are created directly from the TEKS for K-8 mathematics. The TEKS at each grade level are sorted into three or four categories that identify critical areas. Each category is based on a common mathematical idea to which all the TEKS in that group are related, in other words the TEKS will be bundle under each given focal point. Each curriculum focal point also includes all of the TEKS for the underlying processes in that grade, to emphasize the use of these mathematical processes throughout the curriculum. These curriculum focal points for K-8

mathematics present an organization of the TEKS at each grade level that provides direction for making decisions related to instructional time, choice of instructional materials, and depth of questioning.

Turning It Up a Notch: Specific Reading and Writing Strategies to Foster Mathematical Understanding (6-12) *NEW*

The purpose of this session is to use reading and writing strategies to help students begin to increase mathematical understanding by organizing and consolidating their thinking through communication using a developmental model. The strategic instruction that will be covered in this training is an effective means of assisting students in improving comprehension of reading and writing skills in mathematics. In addition, emphasis will be placed on the use of metacognition in the mathematic classroom. In fact, according to scholars students also need to develop their metacognitive skills, because it plays a significant role in reading comprehension (Baker 2002).

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Exit Level TAKS Retest Success with Graphing Calculators, (Grade 12 ONLY)

Students are allowed two tools to complete the Mathematics portion of the TAKS: a Mathematics Chart and a graphing calculator. This workshop prepares teachers to help students succeed on the TAKS Mathematics Retest using the graphing calculator as a tool. The content addresses problem solving using multiple representation, which leads to a deeper and more complex understanding of concepts tested on the Mathematics TAKS. Dunham found studies that concluded those students who use graphing calculator technology are better able to read and interpret graphs, understand global features, and relate graphs (Dunham, 1996).

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