



EXTENDED MATH PROGRAM

Catalina Foothills School District

Catalina Foothills School District, a caring and collaborative learning community, ensures that each student achieves intellectual and personal excellence, and is well prepared for college and career pathways.

Purpose

CFSD's Extended Math Program addresses the needs of K-5 students who consistently demonstrate the ability to think, learn, and perform at advanced levels in mathematics.

Program

District adopted resources/materials are used to teach Arizona's Mathematics Standards, which were adopted by the State Board of Education and CFSD's governing board. Extended Math teachers will use flexible and differentiated instruction to provide an environment that encourages enriched and accelerated learning. Once it is determined that a child qualifies for placement into Extended Math, ongoing assessment and performance will determine continued placement. Students are assessed annually for Extended Math placement and participation. In certain cases, placement may change during the school year based on demonstrated performance and classroom assessment results that indicate this need.

Extended Math teachers and school administrators share responsibility for communicating with parents and others about the mathematics curriculum and the ways in which individual student needs will be met.

Participants

Students are identified for participation in the Extended Math Program through a process that evaluates student achievement and potential based on the following set of criteria:

- Standardized and Criterion-referenced tests for achievement and abstract reasoning (Cognitive Abilities Test [CogAT], AASA [state achievement test])
- CFSD diagnostic tests (required) and other grade level assessment tools (as needed)
- Classroom performance indicators/observations
- Teacher recommendation

Annually, the Cognitive Abilities Test (CogAT) will be administered to students with parent permission. The CogAT is a test of verbal, quantitative, and nonverbal reasoning ability. Students who score at the 97th percentile or higher on the quantitative subtest must be given the opportunity to receive differentiated instruction in mathematics through participation in the Extended Math Program at the elementary level and accelerated mathematics at the middle school level.

Extended Math Teachers and Structures

Instructors have extended knowledge of and/or a strong interest in mathematics and are dedicated to motivating students to stretch their mathematical knowledge and abilities. Grade level structures for delivering the Extended Math program may vary from year-to-year and at each elementary school depending on the number of students who qualify for the program. This is more likely to happen in the K-1 primary grades. Structures may include, but are not limited to extended math classes with an assigned extended math

teacher, in-class grouping (cluster of students within the regular classroom); cross-same-grade level grouping, and out of level placement.

The Extended Math Classroom

Instruction in the Extended Math Program is based on the next grade level's academic standards for mathematics. The program addresses the unique needs of mathematically talented, high achieving students; the pace at which students learn; the depth to which topics are explored; and the complexity of content and materials. Instruction is differentiated across four dimensions: content, process, product, and learning environment.

Content Modification

To make content more appropriate for mathematically precocious learners, teachers can select or modify content so that it is more abstract, complex, and varied. Content might also include the study of creative and productive people in the discipline and use methods of inquiry to develop generalizations basic to the field.

Process Modification

Although the way mathematical information is used cannot be separated from content, teachers can modify the level or type of thought processes emphasized, open-ended questions, inquiry/discovery methods, the overall approach to reasoning (inductive/deductive reasoning and processing), choice, group interaction, and pace of instruction.

Product Modification

The principles of product modification build upon the principles of content and process differentiation. Student products should approximate, to the extent possible, those of creative, productive professionals. This means that the product should be the result of a real problem or concern, be directed toward a real audience, and represent a transformation or synthesis of existing information.

Learning Environment Modification

Teachers can shape experiences that stimulate construction of ideas and ask students to think about them by using varied patterns of thinking to process information gained from experience. The learning environment is a safe place for students to share innovative ideas, debate issues, and express opinions (mathematical discourse); it is characterized by attempts to understand new ideas and reserve judgments. Student independence and initiative are encouraged.

Fluency in Mathematics

Whenever the word *fluently* appears in a standard, the word includes *efficiently*, *accurately*, *flexibly*, and *appropriately*. Being fluent means that students are able to choose flexibly among methods and strategies to solve contextual and mathematical problems. They understand and are able to explain their approaches, and they are able to produce accurate answers efficiently (NCTM). In short, fluency is the ability to solve a problem with understanding (including flexibility), accuracy (attention to precision), and efficiency (strategy, memory, reasonableness of time).

- **Efficiency:** carries out easily, keeps track of sub-problems, and makes use of intermediate results to solve the problem.
- **Accuracy:** reliably produces the correct answer.
- **Flexibility:** knows more than one approach, chooses a viable strategy, and uses one method to solve and another method to double-check.
- **Appropriately:** knows when to apply a particular procedure.