

Key Components of an Effective Mathematics Program

I. Assessment—basis for instruction (11, 12)

Frequent assessment of basic skills, problem solving, conceptual understanding/reasoning

Before: Determine individual placement, based on prerequisite knowledge

During: Monitor daily and weekly progress

After: At end of series of lessons or complete course—were standards achieved?

Analyze student performance: reteach, improve instruction

II. Instruction—“The quality of instruction is the single most important component” (12)

Teacher has in-depth understanding of the content standards and what to teach

Research-based instructional strategies

Guided by assessment

III. Instructional time (12)

Top priority—no interruptions

50—60 minutes per day, active, time on task, more for students below grade level

Homework:

Gradual increase in duration and complexity

Practice basic skills, apply learned knowledge to new problems

Valued and reviewed

IV. Instructional Resources (13)

Focus on grade-level standards

Highest priority standards given the most time and depth

Organized into a logical sequence

Options for different ways of explaining a topic

Students explain their thinking out loud and in writing

Different ideas and tools to reach different students, including remedial and advanced

V. Instructional Grouping and scheduling (13)

What is taught is more important than how students are grouped

Groups based on needs are helpful, but not essential

Cooperative learning must be supplemental and led by the teacher

VI. Classroom Management (14)

Teacher should be positive, optimistic, enthusiastic, purposeful, focused on the standards

Students should be actively involved and motivated by successful learning, not external rewards

VII. Professional Development (14)

Students benefit when teachers cooperate in planning and evaluating instruction

In-services should improve both math proficiency and “pedagogical tools”

Only long-term staff development has value—not “one-shot” meetings

Teachers should be given time to work together to plan math instruction

VIII. Administrative Practices (15)

Mathematics achievement is among the highest priorities

Specific long-term and short-term goals are outlined clearly and reviewed frequently

Consider using math specialists to teach most or all math classes or to coach other teachers

Plan to redesign instruction for substantial numbers of students performing below grade level

IX. Community Involvement (15)

Parents are encouraged to be involved

Materials are organized so that parents, siblings and community members can be involved

Community as classroom— real world examples show the value of mathematics