The No Child Left Behind Act of 2001 (NCLB), the reauthorization of the Elementary and Secondary Education Act, provides funds to states and school districts to support high-quality professional development programs based on scientific research. The aim of such programs is both to increase the number of highly qualified teachers and paraprofessionals, and to help raise student achievement. AFT's Educational Research and Dissemination (ER&D) program is based on proven practice and meets the NCLB criteria for high-quality professional development.

DESIGN: BORNSTEIN ASSOCIATES / PHOTOGRAPHS: PHOTO DISC AND MICHAEL CAMPBELL

A Union of Professionals

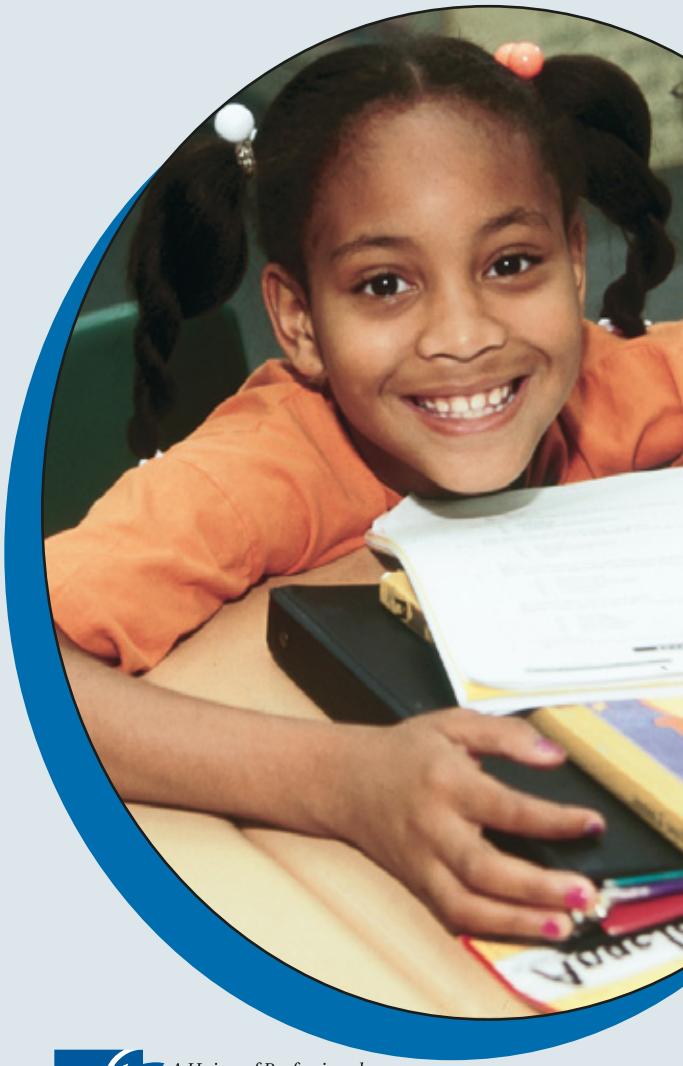
American Federation of Teachers, AFL-CIO
555 New Jersey Ave. N.W.
Washington, DC 20001
202/879-4400
www.aft.org

For more information
visit these Web sites:

www.aft.org/ESEA
www.ed.gov
www.aft.org/erd
or contact:
AFT Teachers
Educational Issues Department
202/393-6384

Item Number 39-0462
May 2003

AFT'S THINKING MATHEMATICS PROGRAM



A Union of Professionals
AFT Teachers

How do AFT's *Thinking Mathematics* courses meet the guidelines of the NCLB Act of 2001?

THE LEGISLATION SPECIFIES:

Strategies based on scientific research.

- The *Thinking Mathematics* approach to math instruction is based on scientific research about how children learn mathematics.

Increased subject-matter knowledge.

- Teachers increase their own mathematical knowledge as they examine how children learn mathematics, the bases for common errors, and core ideas of topics examined.

A sustained, intensive, and classroom-focused experience.

- Minimum time is 30 to 45 hours per course.
- Participants discuss research findings and their implications for classrooms.
- Participants use strategies in their classrooms and reflect on the results.

Improved classroom management skills.

- Participants discuss the real-time implications of practices such as using concrete models, managing classroom discussions, and maintaining students' attention and involvement.

Experiences to help students meet high standards.

- Training in the standards-based instruction process using local and state standards.
- Training in helping students understand the expectations of high standards.

What content does *Thinking Mathematics* address?

Thinking Mathematics is aimed primarily at topics addressed in pre-K through grade 6, but the approach also has been successfully transferred to other grades and math content.

All* Thinking Mathematics *courses stress:

- situational context, understanding and solving word problems (multistep);
- representation of problems;
- understanding and recording student thinking;
- balancing conceptual and procedural learning;
- mathematical justification;
- moving from concrete to abstract; and
- operation properties (e.g., commutative and distributive) that lay groundwork for higher level math.

Thinking Mathematics I addresses:

- counting;
- numeration, place value, and number sense;
- addition, subtraction; and
- patterns and relationships (in number, measurement, and geometry).

Thinking Mathematics II includes:

- multiplication, division, including making sense of remainders, and zero; and
- beginning proportional reasoning.

Thinking Mathematics III addresses:

- fractions, decimals, ratios, and percents; and
- assessment issues for rational numbers.

What are NCLB Mathematics/ Science Partnerships?

Funding is offered on a competitive basis through the National Science Foundation for collaborative efforts in which higher education departments of math, engineering, or science form partnerships with high-need school districts. Other partners, including the union, may be involved. *Thinking Mathematics* can be used in the training offered by these partnerships.

This funding may be used to:

- engage teachers in research and development projects;
- engage teachers as professional colleagues with mathematicians, scientists, and engineers;
- train in the effective use of technology in the classroom;
- evaluate differential salary scales to recruit and retain highly qualified math and science teachers; and
- conduct summer institutes.

Partnership information is available at **www.nsf.gov** (search for Mathematics and Science Partnerships).