

# MCP

Mathematics Coaching Program



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# Mathematics Coaching: Impacting Teaching and Learning in Appalachian Ohio

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# Why Mathematics Coaching?

- Students are unsuccessful in mathematics.
- Teachers and students work harder.
- Students are still unsuccessful.
- Entire school community works harder.
- Students are still unsuccessful
- Entire school districts work harder.
- Students remain unsuccessful in mathematics.

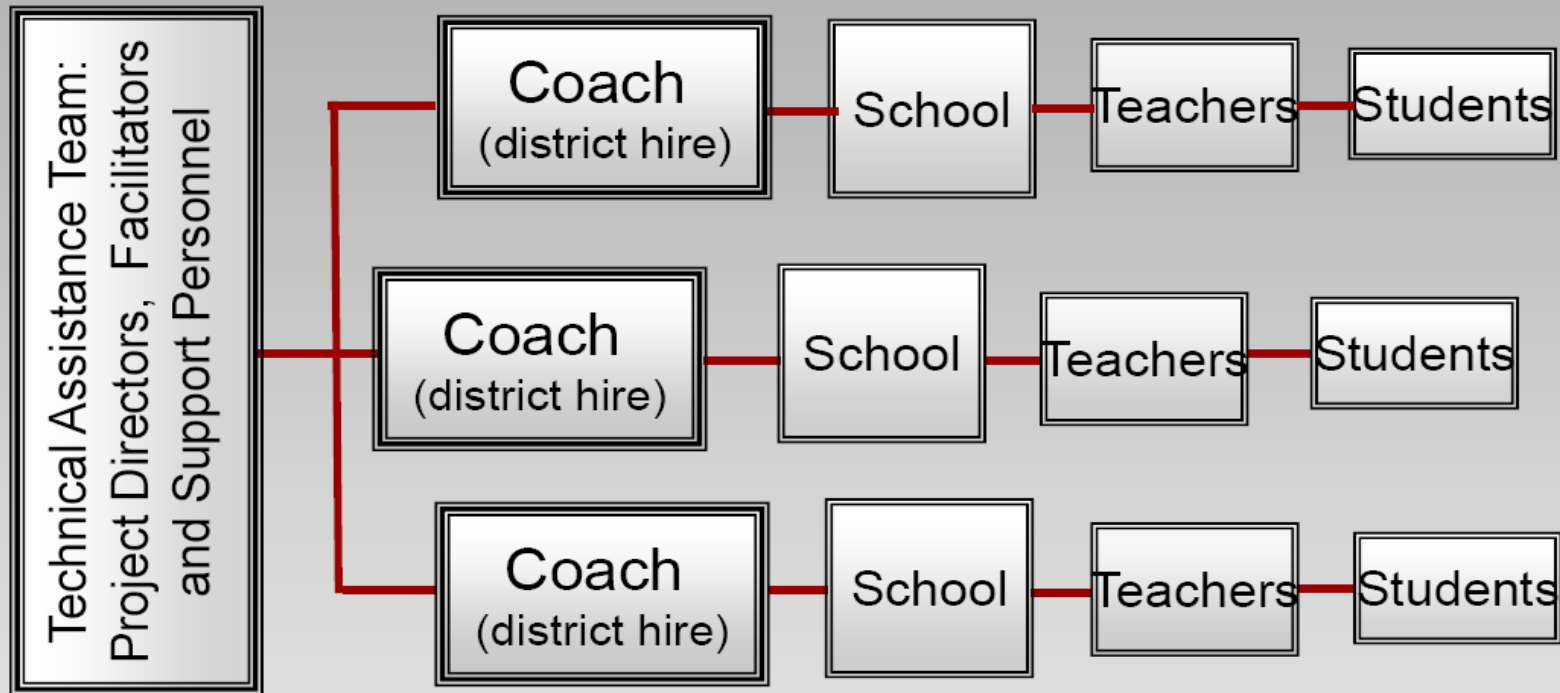
“In many mathematics classrooms across America, the same ritual unfolds: teachers stand at the front of a class demonstrating methods for twenty to thirty minutes each day while students copy down methods in their books. Then, students work through sets of near-identical questions, practicing the methods. Students in these classrooms learn quickly that *thought is not required in math class* and the way to be successful is to watch the teacher carefully and copy exactly what they do.” (Boaler, 2008, p. 40).

# Kids CAN be successful...

- Implementing research-based and field-tested strategies that work
  - Student-centered Mathematics (Van De Walle & Lovin, 2006))
  - Cognitively Guided Instruction (Carpenter, Fennema, et. al, 1999 )
  - Increasing cognitive demand (Smith, Stein, Henningsen, & Silver, 2009)
  - Problem solving versus memorization (Fosnot & Dolk, 2001)
  - Using Process Standards in Instruction (NCTM, 2001)
  - Content-focused Coaching (West & Straub, 2003)

# What is the Mathematics Coaching Program<sup>NEWARK</sup> (MCP)?

- Collaboration between Ohio's schools, Institutes of Higher Education, and the Ohio Department of Education
- Designed to bring individualized, job-embedded professional development to participating schools
- Focused on improving teachers' and students' achievement, growth, and disposition in mathematics



# The work of the Mathematics Coach

- Providing assistance to classroom teachers in mathematics content and pedagogy.
- Modeling, team-teaching, and observing lessons.
- Conducting pre- and post-lesson conferences
- Reading professional materials on the teaching and learning of mathematics for understanding
- Create a school math culture of “I Can”



# MCP Numbers

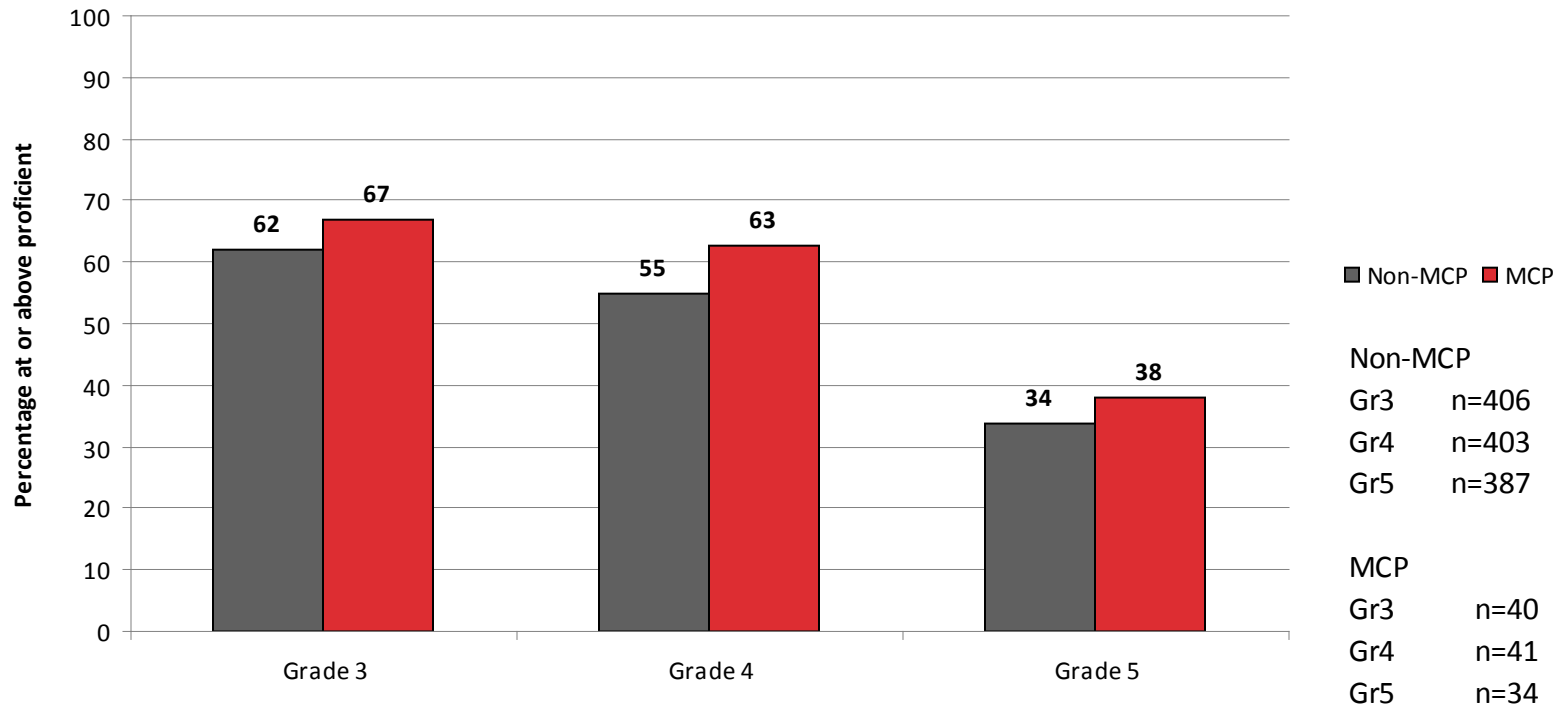
## Statewide

- **Schools:** 175
- **Coaches:** 125
- **Teachers:** ~3,043
- **Students:** ~76,075
- **School Districts:** 58
- **Counties:** 31

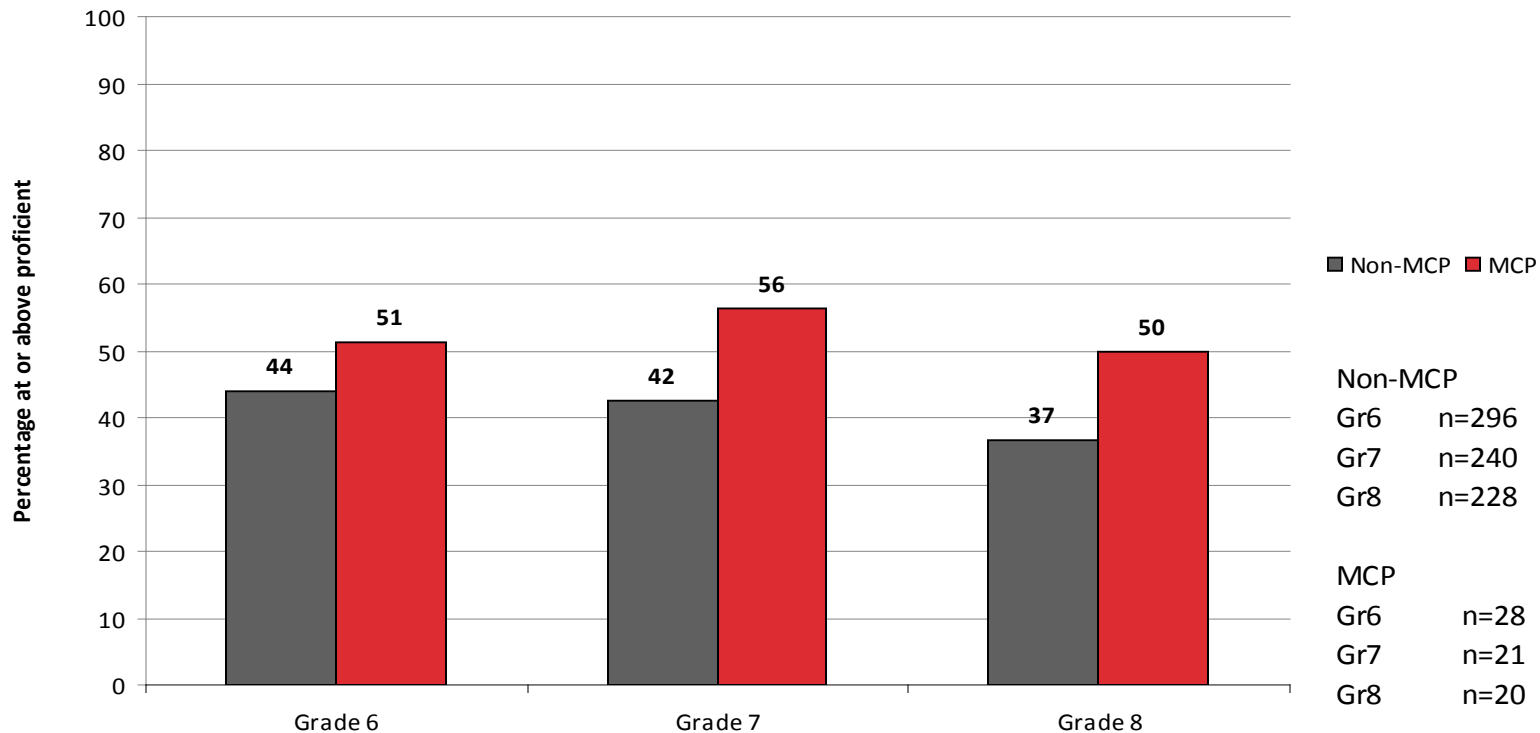
## Within Appalachia

- **Schools:** 5
- **Coaches:** 4
- **Teachers:** ~ 125
- **Students:** ~ 1,970
- **School Districts:** 4
- **Counties:** 3

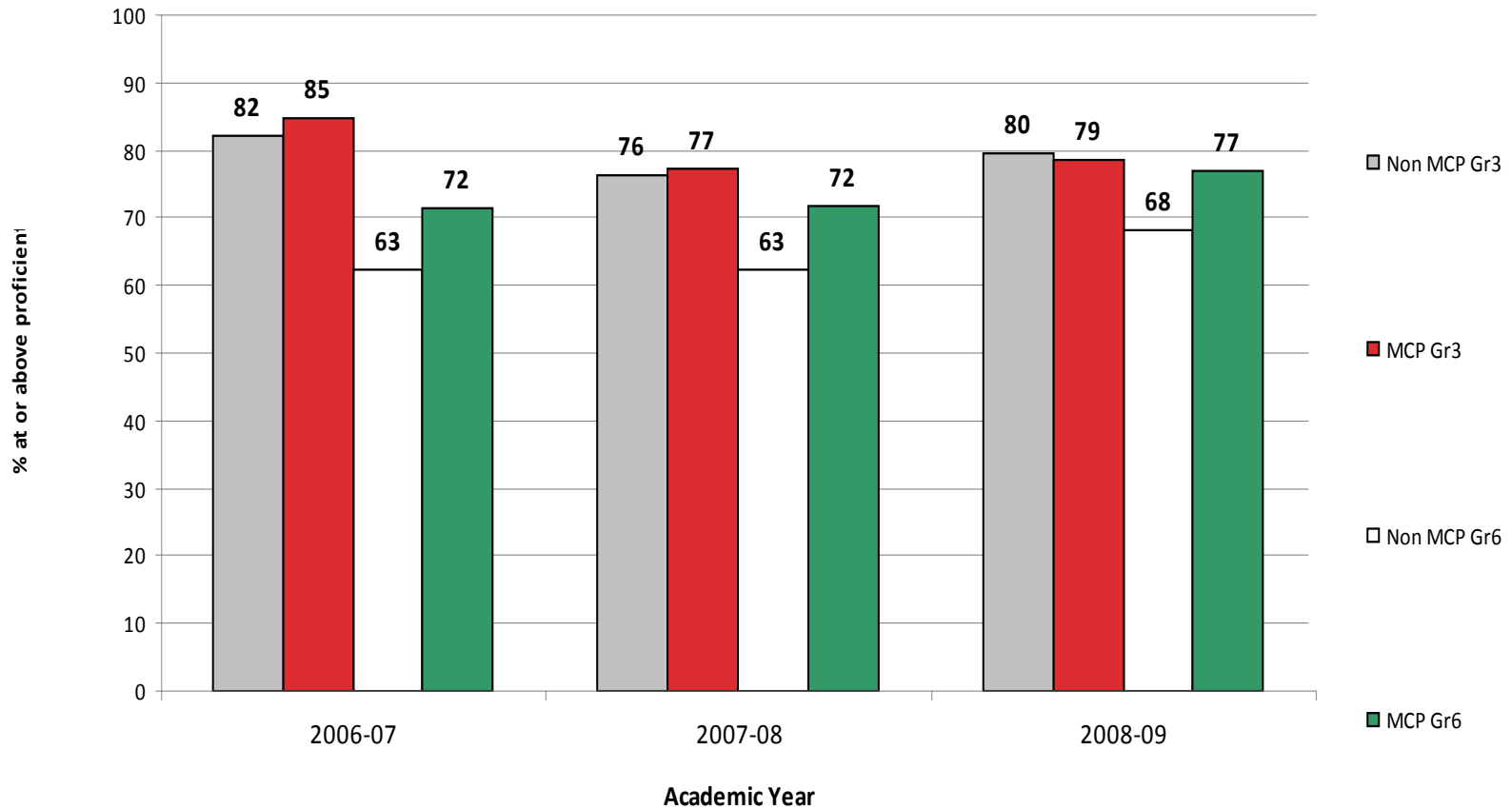
## Ohio Achievement Test Mathematics Proficiency: 2008-09 Elementary Grades



## Ohio Achievement Test Mathematics Proficiency: 2008-09 Middle Grades



## MCP in Rural Schools



# Down by the River School District

- Elementary spans grades K – 8
- 520 students (2008 – 2009 school census)
- 97.5% Caucasian
- 67% Economically Disadvantaged Students
- Median Family income: \$30, 500
- Per capita Median Income: \$13,644
- Unemployment rate: 13.7%
- District in Fiscal Emergency 1999 - 2006

# Down By the River School District

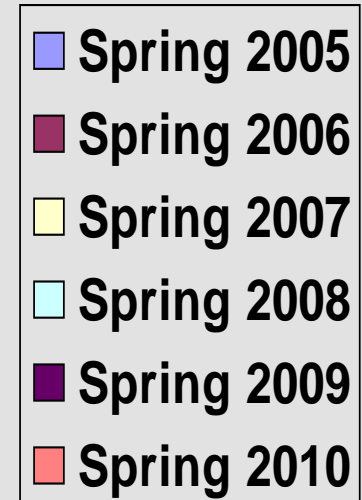
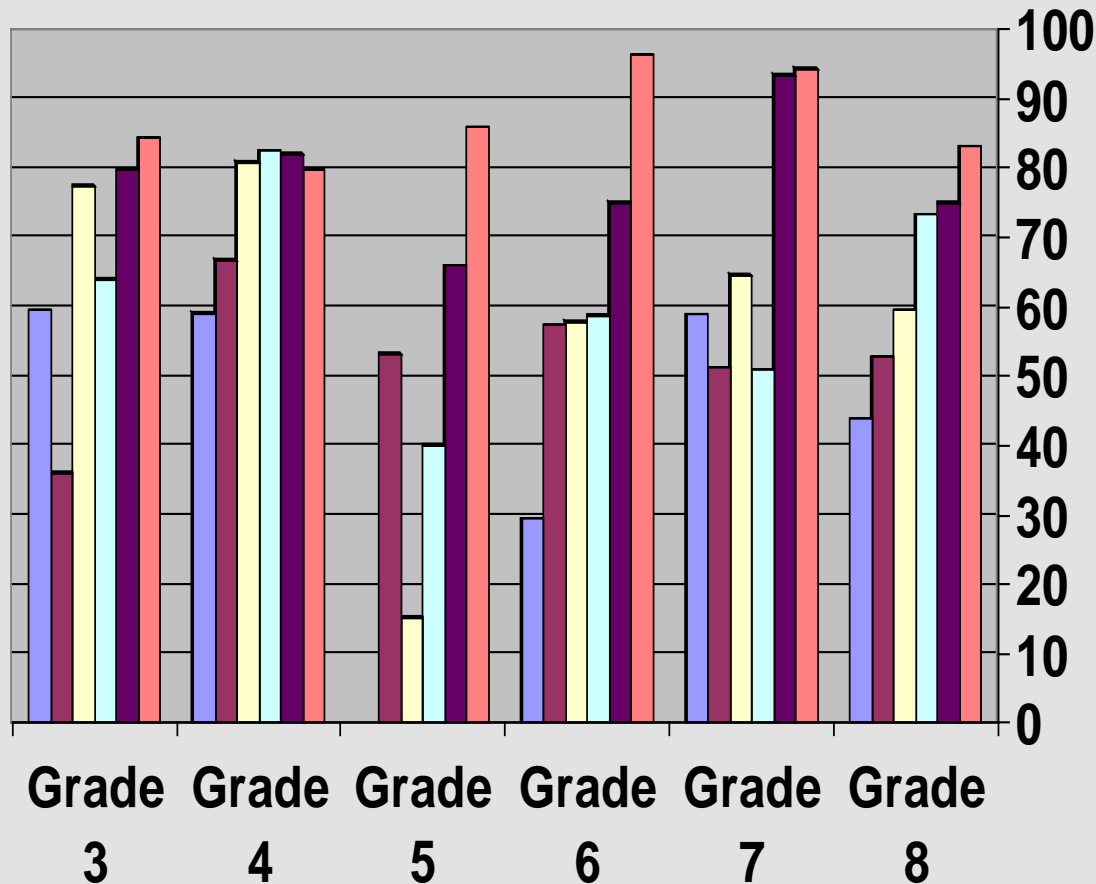
School Year	School Designation
2002-2003	Academic Watch
2003-2004	Continuous Improvement
2004-2005	Continuous Improvement
2005-2006	Continuous Improvement
2006-2007**	Continuous Improvement
2007-2008	Effective
2008-2009	Excellent
2009-2010	Excellent

# Down By the River School District

NEWARK

## Percentage of Students At or Above Proficient in Mathematics

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Spring 2005	59.5	59.1	Not given	29.5	58.9	43.9
Spring 2006	36.1	66.7	53.2	57.4	51.2	52.8
Spring 2007**	77.4	80.8	15.2	57.8	64.6	59.5
Spring 2008**	63.9	82.4	40.0	58.7	51.0	73.3
Spring 2009**	79.7	82.0	66.0	75.0	93.3	75.0
Spring 2010**	84.3	79.7	85.9	96.2	94.3	83.0





# MCP from a Coach Perspective

“When I first began working with the classroom teachers, most of the classroom teachers in the building were very traditional in terms of their math instruction. When I first started doing some initial information gathering about what happens at the various grade levels during math time, I saw a lot of photocopied worksheets and daily math pages.” (School Math Coach)

# MCP from a Coach Perspective

“Once the teachers started to get more comfortable with letting the students do the thinking and the math activity and started letting the math talk happen, there seemed to be a shift in the attitude of the teachers and the students. *Now, the kids are taking more risks, grabbing blocks and manipulatives to help them with the problems we pose, and the students are becoming better problem solvers as a result of the open-endedness.* They don’t feel that there is only one right way to solve a problem anymore.”

# MCP from a Teacher Perspective

“I never really considered myself a strong math teacher, and my math teaching was never as good as what I would do in the other subjects that I have to teach during the day. But, in working with MCP on how to scale back on the number of problems that I give the students to solve and to improve the quality of the problems that we do in class, *I see math differently*. I no longer give answers, and firmly believe that students can figure stuff out on their own.” (4<sup>th</sup> Grade Teacher, self-contained)

# MCP from a Teacher Perspective

“My attitude and the attitude of my students have greatly improved! I think I have tripled the amount of math that they are able to do during the course of the year, and it has mostly come from me no longer showing them what to do. They figure it out on their own. Instead of thinking about things in only one way, the *MCP has allowed me to let go of the one correct answer mentality*. We, as a grade-level team have communicated and collaborated better than we have in the past five years.” (7<sup>th</sup> Grade Mathematics Teacher)

# MCP from a Teacher Perspective

“By implementing some of the small changes – I still do some traditional things in math time – my perspective on teaching math has changed. I don’t have to have all of the answers all of the time. After three years with MCP, they consider themselves good problem solvers. The students can teach me something when I listen to what they have to say.” (8<sup>th</sup> Grade Mathematics Teacher)

# MCP from a Teacher Perspective

“Now, when I think about how I am going to teach a lesson, I think more about what I can do to let the students do the discovering and the thinking on their own. I mean, yeah, it gets hard for some topics, but if I can get them to figure it out – even to encourage them to think about the problem before giving up – it will stick with them longer.” (5<sup>th</sup> Grade Mathematics Teacher)

# MCP from a Teacher Perspective

“[Alex] is on an IEP and we have had some problems from him acting out in the past, especially during math time. But, when we implemented the MCP approach, we started accepting multiple ways to solve problems, [Alex] became the star of the class! He would be one of the first ones who would raise their hand to share the way he had solved a problem. It was simply amazing to see what it did for his self-esteem, and his grades in math have gone from F’s to B’s over the course of the year. There were even a few gifted students in the class who latched on to some of his ideas, and the kids even started to call on him to help within their groups when they got stuck on a problem. MCP has done wonders for [Alex].” (School Middle Grades Intervention Specialist)

# MCP from an Administrator Perspective

“I have to admit that I was quite skeptical when I first heard of the MCP and that it was going to be placed in our school building. However, after the program began, I noticed a complete turnaround in the teachers and the students. I know that the students are adapting a more positive outlook towards math and the teachers are, thanks to some of the MCP approach, being open to the idea of change. I have even noticed some of the grade-level teacher teams using the teaching strategies in subjects other than math.” (Building Principal)



# MCP from an Administrator Perspective

“Before the MCP came to the school, teachers would adamantly tell others how they *hated* to teach math and how they dreaded getting the students ready for the state tests. Now, I am beginning to see an enjoyment in teaching the subject. Yes, we are seeing a mixture of traditional and MCP, but I think the teachers are willing to be open to change.” (District Superintendent)

# MCP from a Administrator Perspective

NEWARK

“I know that I was floored when I saw the testing scores [from short-cycle assessments] from the beginning of the school year until April. There was some dramatic improvement in what the students were able to do and to think about! I just hope that the actual test scores are comparable when the school gets the report this summer.” (Building Principal, 2008)

# Implications for Teaching and Learning NEWARK

- MCP provides a meaningful way to provide sustainable, job-embedded professional development in mathematics for inservice teachers.
- Classroom teachers who do not view themselves as good in mathematics or strong math thinkers need support in thinking differently about their mathematics teaching.
- The MCP approach focuses on student thinking, multiple solution strategies, and student collaboration and communication in the act of problem solving. These skills can increase student confidence and disposition toward mathematics and can increase student understanding and retention of concepts.