

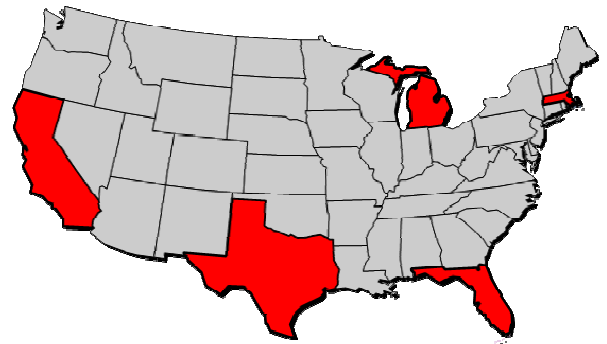


## CASE STUDY

# Core Practices in Math & Science: An Investigation of Consistently Higher Performing Schools in Five States

## Adams Middle School

Wayne-Westland  
Community Schools  
(Michigan)



## Introduction

Since 1999, the National Center for Educational Achievement (NCEA) and its affiliated research teams have studied over 500 public schools across the country in an effort to identify and disseminate effective practices embraced by higher performing schools that distinguish their campuses from their average-performing peers. Building on the foundation established by this previous research, NCEA sought in the current study to focus specifically on educational practices in the areas of mathematics and science in five states: California, Florida, Massachusetts, Michigan, and Texas.

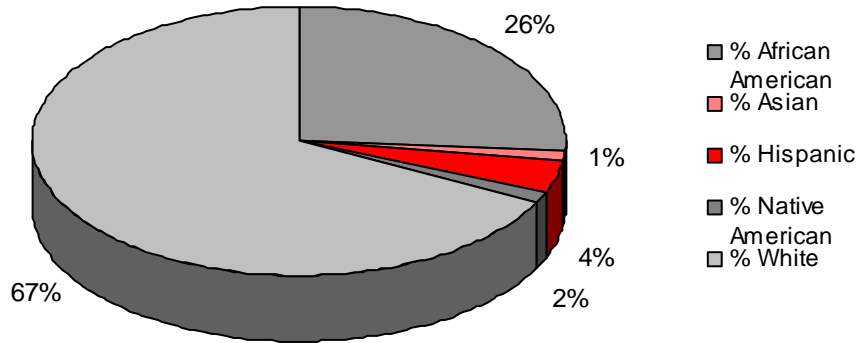
Criteria used in school selection in the current study included three years of state assessment data in mathematics and science (2004, 2005, and 2006), campus demographic make-up, percentage of economically disadvantaged students, school size, and geographic location. In addition, all of the schools selected for participation met the state and federal requirements for Adequate Yearly Progress (AYP) in 2006. Schools categorized as higher performing based on the selection criteria were those “beating the odds” with consistently better student achievement over three years, when compared to peer campuses with a similar student population. Therefore, a list of the state’s highest performing schools may contain schools different from those selected for this study.<sup>1</sup>

In order to illuminate the roles of different members in a school community, for each selected school, NCEA researchers interviewed district-level administrators, school administrators, and classroom teachers. To supplement the interview data, researchers collected pertinent documents, observed secondary level algebra classes, and invited participants to take part in the NCEA *Self-Assessment* online.

<sup>1</sup> For more detailed information about the school identification process and the list of higher performing schools included in the study, please see the full cross-case report at <http://www.nc4ea.org>.

**Figure 1: Student Demographics**

## Adams Middle School



### District and School Profile

With an enrollment of approximately 13,600 students, the Wayne-Westland Community Schools serve students from the cities of Wayne, Westland, Canton, Dearborn Heights, Inkster, and Romulus in the state of Michigan. The school district operates 17 elementary schools, 4 middle schools, and 2 traditional high schools. Many campuses in the district have received the Golden Apple Award for their improvement on the state assessments.

One of the four middle schools in the Wayne-Westland Community Schools, Adams Middle School enrolls 720 students, 60% of whom receive free and reduced-price meals. The majority of the student population on campus is White (67%), followed by 26% African-American students and 4% Hispanic students. Adams Middle School has received multiple awards for its excellent student achievement. These include the Golden Apple Award and the Michigan Middle Cities Muth Award. The school was also a finalist for the National School Change Award and the NASSP Breakthrough Schools award in 2008.

As a strong proponent of higher standards, NCEA recognizes school efforts to move more students to the state's higher standard of achievement by accounting for those students in the analysis of consistent higher performance. Tables 1 and 2 summarize performance at both the state's proficient and advanced standards attained by the students at Adams Middle School for the years of 2004, 2005, and 2006. The state averages included in the tables represent student performance among schools with a student population similar to Adams, particularly based on the percentage of economically disadvantaged students.

**Table 1: Performance Trends based on Proficiency Standard**

Grade	2004			2005			2006		
	6	7	8	6	7	8	6	7	8
Mathematics	Not Tested	Not Tested	65%	63%	59%	62%	65%	63%	66%
Science	Not Tested	Not Tested	75%	Not Tested	Not Tested	81%	Not Tested	Not Tested	77%
State Average for Similar Schools (Math)	Not Tested	Not Tested	41%	51%	43%	48%	60%	54%	57%
State Average for Similar Schools (Science)	Not Tested	Not Tested	43%	Not Tested	Not Tested	65%	Not Tested	Not Tested	66%

**Table 2: Performance Trends based on Advanced Standard**

Grade	2004			2005			2006		
	6	7	8	6	7	8	6	7	8
Mathematics	Not Tested	Not Tested	35%	29%	24%	20%	28%	28%	20%
Science	Not Tested	Not Tested	12%	Not Tested	Not Tested	32%	Not Tested	Not Tested	31%
State Average for Similar Schools (Math)	Not Tested	Not Tested	18%	17%	14%	17%	25%	23%	17%
State Average for Similar Schools (Science)	Not Tested	Not Tested	5%	Not Tested	Not Tested	20%	Not Tested	Not Tested	21%

## Theme 1

### Student Learning: Expectations & Goals

**The district's curriculum is based on the state standards and the Grade Level Content Expectations. District curriculum committees and classroom teachers ensure that the district's written curriculum aligns with the state standards.**

- Department chairs from each school and additional interested teachers form district-wide curriculum committees for each academic content area. These committees review the state curriculum and the Grade Level Content Expectations to make sure the district curriculum is aligned accordingly.
- Inter-district communication provides an avenue for teacher input and buy-in. At Adams, department chairs meet with teachers to discuss curriculum development (e.g., pacing guides, textbook adoption). Department chairs take teachers' concerns to the curriculum committees, but individual teachers may

visit the curriculum committees to express their concerns in person. One district administrator explained, “Most decisions begin at the teacher level, taken to the principals, to the District Curriculum Committee, the Instruction Department, Education Services and then the Cabinet. When [we] go to the board for new curriculum or a new textbook adoption, one of the most frequently asked questions is ‘which group has it gone to?’ They’re very concerned that everyone is approving it.”

- Teachers develop pacing guides during their collaborative meetings, ensuring that they have a deep understanding of the curriculum. Pacing guides clarify the Grade Level Content Expectations for teachers. As one district administrator noted, “Pacing guides in the core content areas...allow teachers (no matter if they are a new teacher or a veteran teacher) to know exactly what the expectations are in terms of what they should be teaching and to keep pace so they don’t fall behind.”

**Cross-grade-level meetings and assessment reviews align the curriculum vertically across feeder schools.**

- District- and school-level employees make efforts to align the curriculum across feeder patterns by holding meetings at various times throughout the year. A K-12 math committee meets a couple of times a year, ensuring that the math curriculum aligns across feeder patterns and grade levels. Additionally, district content leaders in all content areas and from both elementary and secondary levels meet each month with the instruction department to further ensure curriculum alignment. At the secondary level, monthly middle school and high school principal meetings allow administrators to update each other on proposed changes to the curriculum pacing guides as well as any other matters related to curriculum alignment. Administrators invite representatives from elementary schools to these meetings, as well, in an effort to maintain consistency throughout the district. Additionally, high school and middle school principals take the initiative to meet with principals from feeder schools to discuss current practices as well as strengths and weaknesses.
- Another way district and school leaders ensure curriculum alignment across feeder patterns is by examining how students perform on common assessments. Teachers and administrators know whether they need to revise or clarify the district’s written curriculum by determining which content expectations students master on the common assessments. To improve student performance, educators from different schools in the district come together throughout the year to discuss the results on common assessments and, in doing so, clarify the extent of students’ content mastery. As one district administrator explained, “When...conducting curriculum development and textbook adoptions, feeder schools are invited because the assessments given depend totally on what the child has learned in other schools.”

## Theme 2

### Staff Selection, Leadership, & Capacity Building

**The development of Professional Learning Communities transforms the district into a more collaborative environment for teachers.**

- The establishment of Professional Learning Communities (PLCs) greatly increases teacher collaboration opportunities district-wide. Interviewees reported that PLC implementation has been the most important reform to happen within the past few years, since it changed the district culture into a more collaborative environment. PLCs are collaborative teams of educators focused on student learning, organized both departmentally and by grade level. Teachers in the same content area devote one hour per week to collaboration. In addition, there is a common planning hour every day for interdisciplinary team members in the four content areas: English language arts (ELA), math, science, and social studies. A document citing Adams Middle School's transition to PLCs notes: "The teams have the benefit of time, focus, parameters, access to information and ongoing support as they engage in collective inquiry and action research. They work together in an ongoing effort to discover best practices and to expand their professional expertise."
- During PLC meetings, discussions center on school-wide goals as they relate to student achievement. Educators at Adams Middle School consolidate various improvement plans, such as MEAP Improvement, Title I, NCA School Improvement and MI Plan, into a single plan focused on improving student achievement in the four content areas. This focused approach helps teachers organize their efforts, optimizing them for continuous and sustained school improvement.
- Interviewees agreed that what they learn from one another during their PLC meetings is critical to student improvement overall. They feel they benefit the most from learning from one another about teaching styles and techniques. "The power of PLCs is not that teachers are in a room together. They've done that forever. Rather, it's what they're talking about and what they're doing, what they're sharing with one another," one district administrator noted. Teachers' sharing of instructional techniques and strategies enriches their individual teaching styles. As one teacher noted, "If a person is successful in their approach, they share it, and the unsuccessful moments become fewer and fewer." Another teacher explained the importance of working together to be as consistent as possible throughout the school, "Everyone should be on the same page, expect the same things, have the same rules. It makes it so much easier on everyone if the students know what to expect no matter what room they step into."

**The district provides ongoing professional development opportunities for new and veteran teachers, which schools, in turn, support.**

- District and school leaders work to ensure that each new teacher in the district has access to ongoing support necessary for success. District leaders hold a 2-day new teacher orientation program. Once the new teacher arrives at the school, the principal offers another, school-level orientation. The administration then refers the teacher to the content-level team leader, who introduces pacing guides, curriculum, common assessments, and other information specific to their content area. The content-level team leader, who receives additional pay for taking on the responsibility, is the mentor or “go to” person for the new teacher.
- With the encouragement of school and district leaders, teachers seek professional development opportunities throughout the year. The district requires teachers to participate in 2 days of professional development during the school year, with one strictly devoted to technology (e.g., teaching educators how to create their own websites and use smart boards). The district organizes the additional professional development day by content area, based on district-identified teacher needs. In addition to the district-mandated professional development days, schools provide teachers with an additional 6 hours of professional development to fulfill district requirements. Schools set aside funds in their improvement plans for this professional development time. Teachers sometimes choose their own professional development options; otherwise, the school determines the content. Teachers reported that they share whatever professional development they receive with their colleagues during their PLC meeting time. As one teacher noted, “A lot of times if someone goes to a conference or seminar, they come back to the PLC and share the knowledge they gained.”

### Theme 3

## Instructional Tools: Programs & Strategies

**The master schedule at Adams Middle School allows time for additional support classes and instructional time based on student need.**

- Leaders at Adams Middle School ensure that the school addresses all students’ needs by providing varying levels of classes. Adams Middle School offers two levels of math classes in the 7<sup>th</sup> and 8<sup>th</sup> grades. In the 7<sup>th</sup> grade, students can take Math 7 and advanced math. In 8<sup>th</sup> grade, Adams offers pre-algebra and algebra. The recommendation of the previous year’s teacher, based on criteria such as grades, MEAP scores and work ethic, determines student placement. Teachers advance students a level if they show significant improvement. As one school leader explained, “[We] sometimes ask that students who weren’t recommended for higher level course work be added to those classes so they are challenged. [We] look at their MEAP scores, talk

with their parents, and encourage the students to pursue higher level courses.” It is possible for a student taking Math 7 to do very well and take Algebra in the eighth grade.

- Math is the only subject that has different levels of classes within a grade, but students have opportunities to take classes beyond their grade level. For instance, there are 6<sup>th</sup>-graders at Adams MS taking 7<sup>th</sup>-grade courses, and 8<sup>th</sup>-grade students can take high school classes. The school and district provide bus transportation for 8<sup>th</sup>-graders who take classes at the high school. Adams also offers special math and literature classes to the most needy students based on their previous years’ MEAP scores and overall academic performance. A learning consultant teaches two sections of Academic Math in the 6<sup>th</sup> grade, two sections of Academic Literature in the 7<sup>th</sup> grade, and one section of Academic Literature in the 8<sup>th</sup> grade.
- Student grouping for additional support classes provides individual and small-group instruction possibilities. High schools in the district offer Algebraic Foundations, a class offered in conjunction with Algebra I for 9<sup>th</sup>-grade students identified in middle school as needing additional help. The class sizes are small so that students get the help and attention they need during the additional hour of math instruction. The district also offers a skills class taught by a special education teacher. Special education students can choose to give up an elective class in order to take a core-subject skills class that offers an additional support hour in which a teacher can pre-teach, re-teach, or assist with homework. The skills class has few students and serves both students who are in self-contained special education classes as well as regular education students who enroll in the skills class based on a recommendation from the co-teaching team.

**Mandatory programs reinforce literacy and basic organizational skills, ensuring that all students have access to higher levels of instruction.**

- Educators in the district understand the fundamental need to increase their students’ literacy skills. In fact, many of the staff members at Adams Middle School attribute their success in large part to a program called Accelerated Reader. Accelerated Reader is a mandatory program requiring the students to read books from the school library. The goal is for the students to read at least 20 books of their choice per year. An incentive built into the program allows the students to earn points based on the books they read. With the points they accumulate, they can purchase certain personal items (such as scarves, lotions, headphones, and technical devices) at various times throughout the year. Many of the staff members at Adams Middle School agree that students’ ability to read and comprehend at higher levels improves their performance in all subjects. As one school leader shared, “I believe this has significantly impacted all student achievement, not just in English or reading but in math and science. As [we] increase the grade-level reading content for these

students and try to get them at least to grade level or beyond, that has an impact on all student achievement school-wide.”

- Teachers at Adams Middle School reported that their students often lack basic fundamental skills that they need to be successful. For that reason, Adams Middle School provides each student with a Student Planner. The Planner includes the Student Handbook, the school calendar, a log for students to keep track of the books they read and points they gain for the Accelerated Reader program, and a daily calendar for the school year so the students can keep up with their assignments for each class. If a student misplaces the Student Planner, he or she can purchase another one outright or can earn a replacement by completing chores around the campus, such as cleaning or organizing, as directed by an administrator. By using the Student Planners to organize their school assignments, students ultimately learn valuable organizational skills they can use throughout their lives.

## Theme 4

### **Monitoring: Compilation, Analysis, & Use of Data**

**The district provides quarterly common assessments, which assist effective instruction, in the four core content areas.**

- When the state of Michigan provided new Grade Level Content Expectations, teachers developed common assessments during their PLC meetings. The teachers administer these common assessments in math, science, ELA and social studies four times a year. Teachers review data from the common assessments to determine whether students mastered the concepts. When necessary, teachers redevelop questions on the assessments to ensure students exhibit a deeper level of content mastery.
- The district’s data system allows quick turnaround of assessment results to effectively inform instruction. As one school leader at Adams Middle School explained, “The children take most of the common assessments in the computer labs so the answers are immediately uploaded to the district’s data tracking system. So there is immediate feedback.” This timely feedback on how the students are doing in assessed subjects helps teachers provide additional instructional support when necessary.

**Teachers have access to student data and analyze that data often in order to be familiar with student performance and thus increase achievement.**

- District leaders expect teachers to know how their students performed, what they as teachers did to affect that performance, and what they plan to do in the future to raise student achievement. To that end, the district requires that teachers create “Data Walls” to highlight their annual progress on each of the



school improvement goals that developed during PLC meetings. Data Walls display at least 3 years' worth of data, shown in graphs with minimal written explanation. Teachers determine their goals statement and list it on the Data Wall along with the school's criteria for success. They also list the strategies used to accomplish the goal. In addition, the Data Wall exhibits data showing the impact that strategies and actions had on student achievement, as well as next steps for improvement in the coming school year. This activity requires educators to perform a more in-depth analysis of both their data and their efforts to improve student achievement.

- The student data review is ongoing throughout the school year in order to determine content mastery in a timely manner. Teachers constantly review student work during their PLC meeting time. They analyze the data from common assessments and search for information from as many different sources as possible, including other teachers. Teachers reported that they often get valuable information from one another while reviewing student work. As one teacher noted, "We can call up information if we're struggling with a student to find out what's worked in the past. It's getting information from as many sources as possible. So, sometimes it will be a teacher source. Other times it will be a data source."

## Theme 5

### Recognition, Intervention, & Adjustment

**District and school leaders understand the importance of recognizing students and teachers who meet or exceed academic goals.**

- Every school in the district has some type of celebration related to favorable scores on the state assessments. Adams Middle School holds an awards ceremony for those teachers with classes that achieve high MEAP scores. Once school leaders obtain data from the state assessments, they hold a celebration honoring those teachers whose students are at or above the state average.
- Educators recognize student achievement in several ways. Adams Middle School offers a Student of the Month award to students who exceed academic expectations. The Principal at Adams Middle School honors students earning a 4.0 GPA each quarter by taking them to lunch. At the end of each academic year, the school holds an awards ceremony to recognize students for high levels of academic achievement.

**Intervention practices and strategies in place throughout the district provide many opportunities to increase student achievement at all levels.**

- Students who are in need of intervention are identified as early as possible to avoid the need for more intensive, formal intervention later. Educators at

Adams Middle School follow the “Pyramid of Interventions,” which is an outline of various intervention strategies at the classroom, counselor, and administration levels. Teachers and school administrators refer to the applicable intervention strategies, which help educators assist students before the need for greater intervention arises. When educators determine a student requires additional help, the teachers are encouraged to refer to the Pyramid of Interventions to make sure that they do all they can to meet the student’s needs. Some of the most common intervention strategies at the classroom level include re-teaching, Homework Club, and Directed Lunch Study. Homework Club is an after-school program offered two days a week and arranged by grade level. During Directed Lunch Study, students eat their lunch in a classroom setting to make up any missing assignments and get additional help. Additionally, some students who are members of the National Junior Honor Society offer tutoring to struggling students at their school.

- Interventions are timely. As explained by a school leader at Adams, “When the first quarter progress report comes out or even earlier, if the students aren’t doing well, they ask to meet with the parents. They inform the parents of the options available like Homework Club or tutoring from a National Junior Honor Society level student.” Students benefit from these early forms of intervention at the classroom level because interventions significantly reduce the possibility of their getting too far behind in their schoolwork.
- Educators in the district draw upon their communities’ resources as much as possible to raise student achievement and, ultimately, prepare students for college or skilled careers. Eastern Michigan University sponsors two grant programs: Gear Up and Bright Futures. In each of these programs, college students tutor and mentor Adams Middle School students who need extra support. The Gear Up program tracks 7<sup>th</sup>- graders through their senior year and offers additional support along the way. The Bright Futures program offers tutoring as well as a mentoring component for students who need extra help.
- Other grant programs are also available within the district. Upward Bound is a federally funded program with strict demographic requirements: only one high school in the district meets the program’s demographic guidelines. Upward Bound has identified about 90 students in the district, exposed them to cultural education, and helped to prepare them for the ACT. The district also has a joint-grant with the Henry Ford museum to provide a youth mentorship program to high-risk students. The students go to the museum Monday through Thursday. The goal is for the students to apply what they have learned and go on to post-secondary education.

## **Summary of Findings**

### **Student Learning: Expectations & Goals**

The district's curriculum is based on the state standards and the Grade Level Content Expectations. District curriculum committees and classroom teachers ensure that the district's written curriculum aligns with the state standards. Teachers develop pacing guides during their collaborative meetings to clarify the Grade Level Content Expectations, ensuring that all teachers know what they should teach and when they should teach it.

Cross-grade-level meetings and assessment reviews enable vertical alignment of the curriculum across feeder schools. District- and school-level personnel strive to align the curriculum across feeder patterns during meetings held throughout the year. Similarly, schools in the district meet regularly to discuss the results on common assessments in an effort to help students master the curriculum.

### **Staff Selection, Leadership, & Capacity Building**

Professional Learning Communities (PLCs) make the district a collaborative environment for teachers. According to those interviewed, PLC implementation has been the most important reform to happen within the past few years, since what educators learn from one another during those meetings is critical to student improvement. District and school leaders ensure that teachers have access to the resources and support they need to be successful. To that end, the district provides ongoing professional development opportunities for new and veteran teachers. School administrators support these opportunities, as well.

### **Instructional Tools: Programs & Strategies**

The Adams Middle School master schedule allows time for additional support classes and instructional time based on student need. The school provides varying levels of classes to ensure availability of opportunities to address all students' needs. Mandatory programs reinforce literacy and basic organizational skills, ensuring that all students have access to higher levels of instruction. Increasing students' literacy skills has improved student performance in all subject areas. Educators recognize that many of their students lack basic organizational skills they need to be successful. Therefore, they work to teach students beneficial organizational skills that will enhance their education and their lives outside of school.

### **Monitoring, Compilation, Analysis, & Use of Data**

The district's quarterly common assessments enhance effective instruction in the four content areas: math, science, ELA and social studies. When necessary,

teachers redevelop questions on the assessments to ensure students demonstrate a deeper level of content mastery. Teachers have access to student performance data and analyze that data often in order to increase students' achievement. Ongoing review of student data determines content mastery in a timely manner. District and school leaders expect teachers to know how their students performed, what they as teachers did to affect that performance, and what they plan to do in the future to raise student achievement.

## **Recognition, Intervention, & Adjustment**

District and school leaders understand the importance of recognizing students and teachers who meet or exceed academic goals. Awards ceremonies honor both students and teachers throughout the school year. District-wide intervention practices and strategies provide many opportunities to increase student achievement at all levels. Educators identify students in the district who are in need of intervention as early as possible to avoid the need for more intensive, formal intervention later. Educators draw upon their communities' resources as much as possible to raise student achievement and, ultimately, prepare students for college or skilled careers.



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