

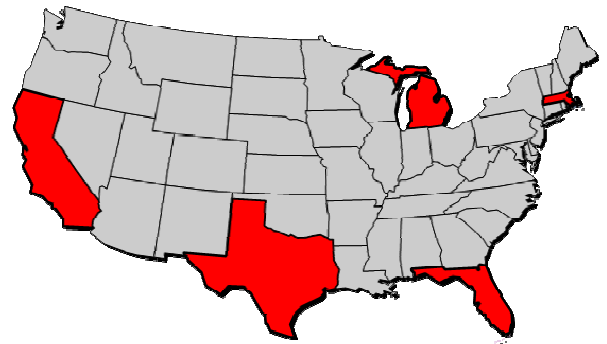


## CASE STUDY

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

## Fairview Middle School

Leon County Schools  
(Florida)



### Introduction

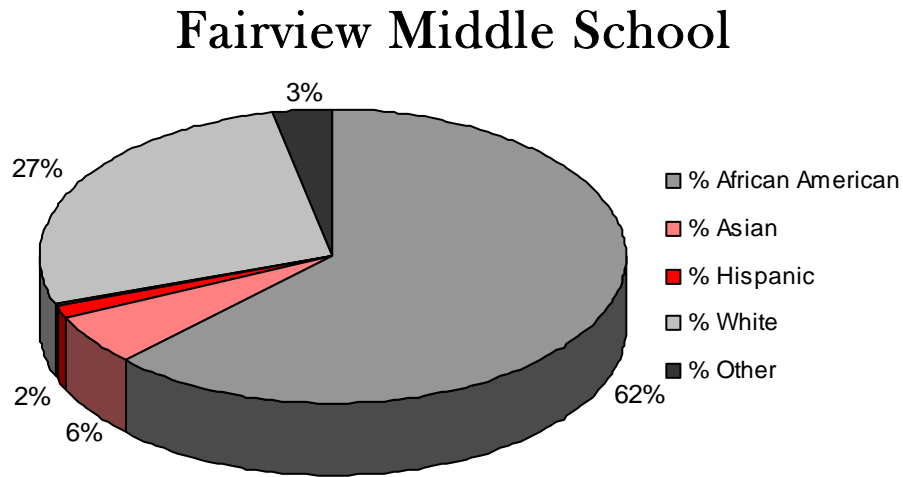
Since 1999, the National Center for Educational Achievement (NCEA) and its affiliated research teams have studied over 500 public schools across the country in an effort to identify and disseminate effective practices embraced by higher performing schools that distinguish their campuses from their average-performing 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**



## District and School Profile

Serving the Florida state capitol of Tallahassee, Leon County Schools enrolls approximately 34,000 students. The school district operates 48 schools, including 24 elementary schools, 9 middle schools, and 6 high schools. English language learners, most of whose parents are degree seekers at the local universities, make up 1% of the student population. Approximately 37% of the total enrolled students are eligible for free and reduced-price lunch. White and African American students account for approximately 90% of the district's student population, at about 50% and 40% respectively.

Open since 1970, Fairview Middle School now serves 830 students, of whom 54% receive free and reduced-price lunch. African-American students are the largest subgroup, at about 62%. Only 0.5% of the students are English language learners. Fairview Middle School houses a pre-International Baccalaureate (pre-IB) program, which currently serves approximately one-third of the school's student population. To enroll in the pre-IB program, interested students from across the district submit applications. Upon completing 3 years of the program, students are eligible for direct entry to the high school IB program.

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 Fairview 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 Fairview, 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	51%	48%	61%	50%	63%	63%	54%	62%	78%
Science	Not Tested	Not Tested	36%	Not Tested	Not Tested	37%	Not Tested	Not Tested	54%
State Average for Similar Schools (Math)	37%	42%	48%	39%	45%	52%	44%	47%	53%
State Average for Similar Schools (Science)	Not Tested	Not Tested	21%	Not Tested	Not Tested	26%	Not Tested	Not Tested	24%

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

Grade	2004			2005			2006		
	6	7	8	6	7	8	6	7	8
Mathematics	28%	28%	33%	24%	37%	34%	31%	34%	46%
Science	Not Tested	Not Tested	8%	Not Tested	Not Tested	19%	Not Tested	Not Tested	22%
State Average for Similar Schools (Math)	14%	17%	19%	15%	18%	20%	18%	18%	20%
State Average for Similar Schools (Science)	Not Tested	Not Tested	2%	Not Tested	Not Tested	4%	Not Tested	Not Tested	3%

## Theme 1

### Student Learning: Expectations & Goals

**Sharing academic goals anchored in post-secondary preparation, educators in Leon County Schools provide students with opportunities to reach college and career readiness.**

- As part of the district’s preK-12 school reform priorities, academic goals and initiatives address college and career preparation. One district leader shared, “What we are looking at is to prepare students with the 12 years in public school to have a choice in avenues they want to take, whether it’s going into work or college.” To sustain students’ educational journeys, such preparation begins in early grades because “the better you get during the first few years, everybody from then on will benefit, especially the students.” For instance, based on data review, district administrators concentrate on literacy skills for students who do not come to school ready to read.

- Students in Leon County Schools have opportunities to learn about requirements and steps for skilled careers. For example, the district office creates Career Academies in areas such as finance, information technology, and health sciences at traditional high schools. At Fairview Middle School, through the state-required career education course, 8th-grade students access assistance for academic and career planning that emphasizes high school completion. One school leader spoke about career planning for Fairview’s students; “we have some students who can’t see past the end of this year, so we need to get them ready for high school, and then they can look at college and beyond.”
- At Fairview Middle School, educators consider student learning the primary focus and establish prioritized and ambitious academic goals. Aiming to advance all students to demonstrate growth and perform at Level 3 or higher on the state tests, Fairview educators clearly define their goals, along with research-based strategies, in the school improvement plan. In addition, educators implement site-based decisions to meet defined goals, prioritizing academic imperatives over school environment targets such as safety and discipline. Site-based implementation applies programs and practices shown to be effective to student intervention and support.
- Educators at Fairview strive to offer students expanded academic opportunities. The principal characterized the school climate as “humane,” since all staff members demonstrate care and go the extra mile to provide opportunities. For instance, to benefit non-IB students, educators extend components in the pre-IB program, such as effective learning strategies and service learning, to the entire student population. Targeting non-IB students, school counselors further engage in conversations with individual students and their parents to ensure that they take advantage of different opportunities, such as the high school IB program, university recruitment programs, and career fairs. In addition, educators at Fairview ensure that all students have access to high school credit courses on campus (e.g., math and foreign languages) or through virtual schools. By administering surveys to determine student needs and interests, educators create additional courses in, for example, Asian languages, robotics, and math competition.

**The district administration guides curriculum development and provides standards-based instructional materials and framework, which school educators implement and enhance.**

- To address academic goals and facilitate instruction, district administrators lead the development of standards-based curricular guidelines and prioritize specific state benchmarks. The district curriculum materials for math and science include identified core benchmarks for each standard that are essential for mastery and performance on the state tests. The district office

also includes pacing guides and textbook correspondence to benchmarks. In addition, the district's math curriculum consists of benchmark clarification statements to help teachers understand skills that students should acquire at the end of each lesson. One science teacher at Fairview observed, "The curriculum accomplishes more than just the standards. It's more extensive and more specific. The standards are pretty cut and dry, whereas the curriculum may extend or expound upon it."

- District curriculum materials also provide instructional strategies. For example, in science, teachers receive suggestions for Essential Questions that spur student inquiry, engagement, and critical thinking. The science curriculum also advises teachers to prioritize instruction strategically based on identified core state benchmarks. Math curriculum materials guide teachers' instruction with information regarding question types that appear on the state test.
- At Fairview Middle School, educators implement the district curriculum and develop it further within the district framework to enhance student achievement. Teachers in each subject area map out the curriculum online for each grade level, adding more detail and specificity based on the district curriculum and the state course outlines. One science teacher explained that "there are essentially two types of curriculum: the master that tells generally what you should do and your working one that tells what you actually did and what areas you have been held up on." The teacher-developed curriculum maps include identified skills, assessments, and resources. In math, teachers further identify strands in the state standards to teach in more depth at each grade level. For instance, while addressing all the strands, 6th-grade teachers give more attention to number sense and data analysis; 7th-grade instructors concentrate on geometry, measurement, and probability; and 8th-grade classes focus on algebra.
- To engage students and enhance learning results, Fairview educators augment the district curriculum by integrating subject areas. Connecting science, math, and technology helps educators promote inquiry, application, and the discovery of answers among students. This curricular integration is part of a project conducted by the Florida Center for Research (FCR) that focuses on STEM--science, technology, engineering, and math. According to the principal, the decision to participate in STEM to integrate subjects originated because "most of the scientists and mathematicians are going to come from some place else in the next decade. If the United States wants to be competitive, it has to learn different ways and put more effort into math and science and do it better. The integration brings visualization and application to students' lives. In the real world, mathematicians and scientists have to know both subjects."

## Theme 2

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

#### **Principal selection, transition, and development in Leon County emphasize meeting school needs.**

- School needs direct selection and assignment of school administrators in Leon County. While the district office recruits and maintains candidate pools for school site administrators, candidates for principalship do not apply for positions at specific sites. In making decisions regarding principal assignments, district leaders review school needs based on student performance data and parents' responses on the district-administered School Climate Survey. To ease administrative transitions at school sites, district leaders engage in timely candidate selection and acknowledgement in order to address campus needs. By assigning the selected principal early, district leaders allow the incoming administrator to work with the departing principal for an entire year. The early transition ensures continuity in administrative efforts focused on the school's needs. One district administrator expressed, "It tells the school that the principal is leaving. A new principal is coming in, and they will know what the change will be. It speeds up the process of change at the site because, rather than having to learn the system, the new principal works within the system to figure out what changes they need to make and what things to continue, without a year's effort to focus on that when they first take over."
- The district office's provision of needs-based training further ensures principals' effective performance as instructional leaders and site managers. For example, training in systematic classroom walkthroughs equips principals with the ability to quickly discern overall practices at the school site, making effective program monitoring possible. For the district's new career-focused magnet programs in high school, training enables principals to enable them to define programmatic purposes clearly and perform tasks in design, selection, and maintenance.

#### **District and school administrators recruit quality instructional staff while developing and capitalizing on classroom-level expertise.**

- Teacher recruitment in Leon County centers on creating a sizeable pool of quality candidates. District and school administrators actively take part in recruitment events and cultivate dialogue with community members and organizations, including local higher education institutions. Because of the societal challenges surrounding Fairview Middle School, to expand the available pool, leaders have to put in additional efforts and "go where the teachers are and bring them in." Current teachers at Fairview help with

recruitment efforts by identifying interns or student teachers that exhibit great potential.

- Starting with newly hired teachers, the district office invests in its instructional staff to achieve effective retention and practices. One district leader expressed, “The longer duration [teachers] are with us, the better it will be for them to understand the academic structure and program delivery. It allows the person to do a better job in the classroom.” While all teachers have access to systematic professional development, beginning teachers also participate in a comprehensive district program, featuring elements such as school-based and district-level mentoring, classroom management training, regular focus groups to elucidate subject-specific standards-based instruction, and shadowing in similar classroom settings. In addition, the district office offers special education staff tuition assistance and collaborates with local universities on online courses for associate, bachelor’s, and master’s degrees.
- The district office constantly draws on teacher expertise to inform curricular and instructional decisions. For instance, district leaders invite teacher participation in the development of curriculum and formative assessments. To increase teacher buy-in with instructional programs and practices, one district leader expressed, “The district isn’t big into mandating.” Instead, district administrators often start a new program with a core group of teachers in charge of piloting and identifying best practices. After piloting, teachers who have achieved success with the program and developed best practices then offer staff development, provide assistance, and get their colleagues on board.
- At Fairview Middle School, administrators provide multiple opportunities for teachers to become leaders. One administrator shared, “We delegate tasks and look for and develop teacher leadership, encouraging teachers’ strengths when identified, getting those teachers on board and letting them run with it, and showing them we have faith in them.” For example, school leaders ask teachers who demonstrate excellence in instructional strategies to train colleagues. Teachers also receive opportunities to represent the school at local universities. In addition, school administrators constantly encourage and provide support for teachers to pursue campus leadership positions.

**Collaboration among educators is common in the district and occurs across and within schools. Such collaboration greatly impacts student achievement.**

- Educators in Leon County collaborate vertically to facilitate student achievement and attainment of district goals and initiatives. Communication and collaboration across feeder patterns are prevalent. At Fairview, teachers and administrators maintain frequent communication with their feeder schools

to address student needs collaboratively. One school leader shared, “Fairview has a program where 5th-grade teachers visit before students come, and we ask them straight out, where the problems are and what we should expect, especially academically. We need to get those students with gaps immediately.”

- At Fairview Middle School, educators value collegial collaboration. One science teacher observed, “At Fairview, the biggest reform has not been one from outside, but the ability of the people within to work together to communicate.” Communication among teachers is primarily instructionally focused and has improved because of embedded collaboration time in the master schedule. In addition to sharing ideas learned at conferences or workshops, teachers collaborate to align instruction within and across grade levels, perform curriculum mapping, and discuss student performance and intervention. Informally, teachers also take time to communicate in the hall. Regarding the benefit of collaboration, a teacher expressed, “The face to face discussion about what’s going on is the number one, most valuable tool we have. When teachers need something, they get it. The major impact on the students is from the way we take time to bounce ideas off of each other, to discuss what’s working, what’s not working, even across grade levels.”
- Collaboration across grade levels equips teachers at Fairview with curricular knowledge that enables them to be vertically accountable for student mastery. One school leader explained that the vertical conversation from curriculum mapping ensures “everybody knows what is being taught, what to expect, and what they need to do.” Regarding student mastery at each grade level, one science teacher noted, “As a 6th-grade teacher, because students are not tested until eighth grade, I emphasize students’ really remembering and understanding the content.”
- Subject integration and teacher teaming engender regular cross-curricular collaboration at Fairview. In department chair meetings, administrators lead discussions about state standards and ensure cross-subject awareness of expectations. Math and science teachers collaborate on unit development, particularly in strands such as measurement and number sense. School administrators strive to place students in groups that share the same teacher for each core subject. Teachers working with the same group of students meet as a team in common planning periods in order to address student needs with cross-curricular support and consistency. For example, in the area of vocabulary instruction, teams of teachers use the same terms for concepts across subjects to reinforce learning.



## Theme 3

### Instructional Tools: Programs & Strategies

#### **Educators in Leon County Schools stress active student engagement to augment learning.**

- Emphasizing instructional practices that foster student engagement, administrators provide teachers with resources and assistance to enhance the management of students' attention. At Fairview Middle School, administrators emphasize instruction that is not textbook-driven and work to engage students with updated information and manipulatives. One leader shared, "Education and how students learn change a lot, and it's difficult to use textbooks that have not been updated." In science, teachers have access to resources such as *Newspapers in Education*, *United Streaming*, and webcasts. In addition, through the school's involvement in the FCR STEM project, math and science teachers develop hands-on lessons using equipment that allows control, manipulation, and experimentation.
- District-wide, reading is a focus that educators infuse in instruction in all subject areas to engage students more completely in the learning process. Regarding reading as a critical skill for enhanced student engagement, a district leader shared, "The ability to break up a text and understand it is essential in all our core areas. In secondary education, it's about helping teachers not assume that students understand the purpose of what's written." At Fairview, reading strategies are part of every subject and facilitate "learning to read in a technical fashion to assimilate, break down, and analyze non-fiction writing."

#### **At Fairview Middle School, course enrollment and placement arrangements focus on achieving learning results and challenging students appropriately.**

- To adequately challenge each student on campus, educators at Fairview focus on student enrollment in advanced courses. For instance, the school administration enrolls non-IB students in upper level classes to allow them to stretch academically. One leader expressed, "At Fairview, we don't keep a child at a level because that's what the test score says. We don't create a situation where children aren't challenged all the time or aren't allowed to think and question all the time." Using both performance data and teacher recommendations, educators place students in advanced and high school credit-bearing courses such as pre-Algebra, Algebra I, and foreign languages.
- Flexibility in placement enhances learning and prevents student frustration. At Fairview, student placement is flexible at both the school and classroom levels. In the classrooms, for instance, math and science teachers frequently group students by ability level to encourage them to help and learn from one another. For higher level courses, school administrators maintain flexibility by

allowing students to temporarily enroll in such courses. After trying out an upper level course, students who are uncertain or unready receive alternative course placement arrangements that meet their needs and continue to challenge them academically. A leader shared, “We don’t want to encourage frustration. We do try to expose the students, for example, by encouraging them to test a class for a while. If it doesn’t work out, we find a way to enroll them based on their needs.”

## Theme 4

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

**With collected data, educators in Leon County Schools conduct regular progress monitoring to identify achievements and adjustments.**

- As educators establish priorities and goals, ongoing progress and program reviews take place at the district level. For instance, the district office published a mid-year review for the 2007-08 school year that focused on both areas of need and achievements. Similarly, the district administration evaluates how district-wide programs impact students over time and suggests subsequent strategies for improvement. For example, district leaders determined through data review that teachers under-used the credit recovery program in high school. The leaders then demonstrated how teachers could alter the program to meet specific needs, and continued to monitor program use. One leader observed, “Now we are finding that the program is being used very successfully.”
- Based on school-level data, instructional leaders on campus create and regularly monitor established objectives. One way to ascertain campus-level progress effectively is through consistent instructional monitoring. Walking through classrooms frequently, school leaders at Fairview ensure the implementation of research-based strategies that engage students and address standards. One district administrator shared, to monitor school progress successfully, “administrators have to be in the classroom to be aware of the overall school structure, expected academic coverage, the speed of coverage, and the focus on certain areas.” Such awareness facilitated Fairview leaders’ mid-year evaluation of the objectives identified in the 2007-2008 School Improvement Plan.

**School educators assume primary responsibility for monitoring student performance, with assistance from the district administration and parents.**

- Performance monitoring in Leon County frequently starts early and continues in regular intervals. One district administrator shared that, for grade level transitions, “the most important [issue] is for teachers to have time before school to know the needs and performance of the incoming students, making sure their schedules are fitting the profile of the students coming in.” At

Fairview Middle School, teachers use prior performance data to become familiar with their students' previous difficulties and achievements. One science teacher noted, "We look at the scores, for example, from the end of the year last year, to see where the students are when they get to us, what they remember from previous levels. If there are gaps, we are able to review [with] the students so that they remember what they learned before." To facilitate continuous student monitoring, the district office also creates formative assessment tools in subject areas such as writing and science, since educators must prioritize "monitoring in between because you can't wait one year until the state assessment."

- With a variety of resources and strategies, every educator at Fairview Middle School conducts performance monitoring to focus instruction on prompt remediation of student weakness. In addition to district benchmark results, teachers monitor progress with data from regular and common assessments from adopted textbooks, ongoing research studies such as FCR STEM, computerized learning programs, and teacher creation. Individual teachers also frequently assess students verbally and create opportunities for students to show understanding, for example, through small-group discussions or presentations. In addition, leaders at Fairview purchased a school-based data monitoring system to allow every educator easy data access and the capability to manipulate and analyze student data.
- By providing parents with information, educators increase parental involvement in education. At Fairview, parents of pre-IB students demonstrate regular involvement in education, but, as the principal observed, "Sometimes we think poor families don't support their children, but they do and they care a lot...They just didn't know what their child could do." Parents at Fairview have access to grades and assignments online and on paper. For every nine-week grading period, teachers send progress reports to keep parents regularly informed. Several teachers also generate weekly reports for students at risk of failing. Recognizing confusion about accountability, Fairview educators explain assessment data to parents via "FCAT Chats." In addition, the district administration supports parental involvement by means of community forums, school climate surveys, and the *Parent Guide* publication that explains promotion, intervention, assessment, and performance monitoring.

## Theme 5

### Recognition, Intervention, & Adjustment

**With district resources, school-level educators develop site-based interventions for struggling teachers and students.**

- As part of instructional monitoring, school leaders provide assistance for struggling teachers. At Fairview Middle School, the principal creates a multi-

faceted plan, specifying steps and administrative support for the struggling teacher. The principal expressed, "What helps those teachers the most is the support from school administration that allows them to feel we have their back, so they will change." In addition to frequent conversations with the principal, struggling teachers may also spend time attending district-provided staff development activities or visiting teachers who are more successful on campus.

- School educators use district resources to meet specific student needs on their campuses. One leader at Fairview stated, "The district provides the resources, the workshops, and then the school educators take those and use them as they see fit." For instance, some schools in the district administer the quarterly benchmark assessment, Write upon Request, once a week to ensure student familiarity with writing tasks that involve prompts. Educators at Fairview maintain a school-wide reading focus by implementing reading strategy programs provided by the district office for specific subjects in all departments.

**At Fairview Middle School, student intervention focuses on academic promotion and character education and includes flexibility to suit student needs.**

- With regards to student intervention, educators at Fairview embrace the district-wide concentration on promotion. One district leader stated, "The district has been trying to not retain students but to keep them with their cohort group. We put the stick here for students to jump over, and we need to figure out a way to get them over if they are not ready." With the focus on promotion, the district office prioritizes credit and course recovery. For instance, at Fairview, students have the opportunity to make up for failed courses as well as for D or F grades. Administrators at Fairview also work diligently with overage students, for example, by communicating with nontraditional schools that provide students with alternative routes that propel them toward their proper grade levels.
- Students at Fairview enjoy ample and frequent support from community members who emphasize academic success and character education. With socio-economic challenges faced by many attending Fairview, school leaders keep the school door open to the community. One leader observed, "People come into the school and realize the need and see how they can make a difference." Many community members volunteer to mentor and reach out to the students. For instance, some male African American community members work with a group of 6th-grade male students on character education and agree to sponsor college education for those who complete high school. Another community member works with male students in seventh and eighth grades on self-esteem and schoolwork. Programs on character and academics are also available for female students during the school day.

- Academic support at Fairview includes flexible scheduling and accessibility to students regardless of their ability levels. One school administrator shared, “You have to have the same energy and resources that you give your high-achieving students that you give your middle- and low-achieving students.” In addition to assistance before and after school, the creation of elective courses targeting specific areas increases instructional time for struggling students. Educators at Fairview also provide support courses during elective periods for one semester or one nine-week grading period to benefit, for instance, struggling readers and advanced students in math classes and in the pre-IB program. Students struggling in math, furthermore, may concurrently enroll in regular and “lab” classes.
- As part of scheduling for student intervention, staff allocation is also flexible and focuses on meeting student needs. School administrators at Fairview both coordinate staff assignments to accommodate intervention plans, such as tutoring and elective support courses, and take on interventional tasks themselves. For instance, a school counselor with a math background teaches a nine-week math enhancement class during the first period. For students with special needs, both co-teaching and pullout models are available to effectively support them, based on their performance data, grade levels, and problem subject areas.

## **Summary of Findings**

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

Focusing on the entire preK-12 school system and providing students with abundant opportunities, educators in Leon County Schools ensure post-secondary readiness for college and skilled careers. In their effort to address established academic goals and facilitate instruction, educators engage in the development a standards-based, resource-rich, and achievement-focused curriculum.

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

Staff selection and development in Leon County Schools emphasize addressing needs on campuses. Selection and assignment processes for school-level administrators in Leon County particularly focus on smooth transitions and the placement of personnel capable of continuously and effectively meeting areas of need. For the teaching staff in the school district, administrators concentrate on capacity-building and collegial collaboration as means of enhancing student achievement.

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

Instructional practices and focuses in Leon County Schools stress active student participation and learning augmentation, with resources that provide up-to-date information, instruction that develops reading skills, and materials that facilitate hands-on experience. Through student placement arrangements, educators aim to not only attain learning results but also provide appropriate challenges.

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

Consistent progress monitoring in Leon County Schools helps educators to identify both accomplishments and areas for improvement. To ensure student achievement, educators make use of available resources, conduct timely and frequent performance monitoring, and provide parents with useful information that engages them in their children's education.

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

Following progress and performance monitoring, educators in Leon County Schools ensure the availability of needed support and intervention for struggling staff and students. To meet student needs effectively, educators focus intervention plans on academic promotion, community-sponsored character education, and built-in flexibility in scheduling and staff allocation.



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