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Ensuring Success and Closing the Achievement Gap for All of California's Middle Grades Students

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# Recommendation Four Relevance

Powerful teachers are strengths-based and student-centered. They use students' own experiences, strengths, interests, goals, and dreams as the beginning point for learning, competence, and accomplishment. Thus, they tap students' intrinsic motivation, their existing, innate drive for learning.<sup>1</sup>

**Recommendation 4 — Relevance.** Meet the needs of middle grades students by developing a rich set of courses and enrichment opportunities that infuse learning with technology, visual and performing arts, career/real-world connections, service- and project-based learning, and multicultural experiences. Engage students as lifelong learners by developing socially relevant cross-curricular understanding and opportunities for meaningful participation before, during, and after school.

Relevance is one of the Recommendations in the Focus Area on [Developmental Responsiveness](#).

The recommendation on relevance is the first of five under developmentally responsive and socially equitable practices. High-quality middle schools respond to the developmental and academic characteristics and needs of young adolescent learners. Who are these students? Why are they different from elementary school students and high school students? How do educators make learning relevant to this age group, establish nurturing relationships (refer to Recommendation 5—[Relationships](#)), and smooth not only the transitions from school to school (refer to Recommendation 6—[Transitions](#)) but from childhood to adulthood fairly and safely while building character and resilience? (Refer to Recommendation 7—[Access](#), and Recommendation 8—[Health, Safety, and Resilience](#).)

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#### **Footnote**

<sup>1</sup>Bonnie Benard, "Resilience, What We Have Learned," in *Third Space: When Learning Matters*, Washington, D.C.: Arts Education Partnership, 2005, 65.

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# Making the Middle Grades Relevant and Engaging

One of the consistent threads running through the research on improving adolescents' circumstances and school performance . . . is that social and emotional factors are a key to the solutions. Whether we call it 'personalization,' 'student connectedness,' 'positive youth development,' 'student voice,' or SEL [social-emotional learning], there is a consistent message in the research.<sup>1</sup>

From the moment students set foot on the middle grades school grounds, they begin forming beliefs about how well they fit in, their safety, and how much they look forward to being a part of the new community. For a longer discussion on engaging students as active learners, refer to the later section on [Personalized environment and opportunities for student voice](#).

Effective middle grades educators make sure that students develop positive associations with school:

- Through strong articulation programs preparing students for middle school, the students and parents form positive expectations about how to be successful in this new school.
- The school grounds and buildings are bright, cheerful, clean, and welcoming.
- Teachers present engaging lessons, challenging questions, and opportunities for each student to participate in meaningful work.

Students who feel connected to their school are more likely to perform better in all classes, to gain self-esteem, and demonstrate responsible behaviors in their school setting. Standards-based lessons are most effective when the learning is relevant to students. In fact, research supports the need to deliver standards in a way that is relevant to students: ". . . high levels of engagement appear to relate positively to higher academic achievement for all populations."<sup>2</sup>

The opposite is also true: lack of engagement hinders academic achievement. "Although dropping out typically takes place during high school, the process of disengagement and alienation that ultimately leads students to leave school prematurely may start as early as first grade but more often starts or is exacerbated during the middle school years."<sup>3</sup>

According to criteria of the [Schools to Watch™-Taking Center Stage](#) program, in high-impact middle schools, "the curriculum is both socially significant and relevant to the personal and career interests of young adolescents. Students talk about daily issues in their own lives, their community, and their world."



## In the Spotlight

**McKinleyville Middle School, McKinleyville Union Elementary School District, a**

### 2006 Schools to Watch™-Taking Center Stage Model School

Eighth-grade science, math, and language arts classes work together on units that reinforce physics content such as trajectory and water pressure (bottle rockets), simple machines, and motion and acceleration (mousetrap cars).

- [McKinleyville DataQuest School Profile](#)
- [McKinleyville Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage Model School—Visitor's Guide: McKinleyville Middle School](#) (PDF; Outside Source)
- [Schools To Watch™-Taking Center Stage](#)

## Related Links

- Recommendation 1—[Rigor](#), TCSII.
- Recommendation 2—[Instruction, Assessment, and Intervention](#), TCSII.
- Recommendation 6—[Transitions](#), TCSII.
- Recommendation 8—[Safety, Resilience, and Health](#), TCSII.

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### Footnotes

<sup>1</sup> Mary Utne O'Brien, "From CASEL's Leadership," *CASEL Connections*, March 2006.

<sup>2</sup> [Academic Achievement in the Middle Grades: What Does the Research Tell Us?](#) (PDF; Outside Source) Atlanta, Ga.: Southern Regional Education Board, 2003, 7.

<sup>3</sup> Jaana Juvonen, Vi-Nhuan Le, Tessa Kaganoff, Catherine Augustine, and Louay Constant, [Focus on the Wonder Years](#) (PDF; Outside Source). Arlington, Va.: Prepared by the RAND Corporation for the Edna McConnell Clark Foundation, 2004, 48.

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## Adolescent Characteristics

Young adolescents are 10 to 14 years old and are in the uneven transitional period between childhood and young adulthood.

The majority of young adolescents are still concrete thinkers who need to touch, feel, and manipulate objects to understand them. Students at this age learn more by doing than by just seeing or hearing. Since much of the curriculum in middle school is symbolic and abstract, middle school educators teach abstract content through physical activity as much as possible.<sup>1</sup>

Planning and delivering effective learning experiences to middle grades students is easier when educators understand the developmental characteristics and needs of their **clients**—adolescents. For example, research consistently demonstrates that most adolescents learn best when they experience success and are engaged in learning about things that matter to them. Research also shows that teachers can and do influence students' perceptions about their abilities.<sup>2</sup>

Adolescence is a time of rapid growth and inconsistent change that varies widely among individuals. In general, the approximate ages of 10 through 14 are characterized by:

- Physical growth and hormonal development: bone, muscle, brain, sexual characteristics, stature.
- A growing ability to use abstract thought.
- Social and emotional growth, including awareness of others, sense of fairness, social consciousness, sense of purpose, personal identity (who am I?), peer bonding, separation from family, and sudden, intense emotions.

Recent brain research explains more about how adolescents learn. One recent finding shows that the human brain does not finish maturing until about age 25.<sup>3</sup> Related studies indicate that the adolescent prefrontal cortex is not fully developed. This section of the brain is responsible for complex thinking. The prefrontal cortex allows the mind to organize, perform abstract thinking, prioritize, anticipate consequences, control impulses, and adjust behavior accordingly.

The prefrontal cortex is the largest and slowest part of the brain to develop and undergoes the most drastic changes during adolescence. Because the prefrontal cortex is underdeveloped, the adolescent brain relies heavily on another area called the amygdala, which is linked to both fear and pleasure responses. Researchers believe that reliance on the amygdala creates a tendency for adolescents to react on instincts. These findings suggest that adolescents do not biologically have the same abilities as adults to control impulses, anticipate consequences, and make fully reasoned decisions.<sup>4</sup>

Another hypothesis arising from brain research appears to support the call for high expectations for all adolescents. Dr. Jay Giedd is a neuroscientist at the National Institute of Mental Health and one of the pioneers in brain research using magnetic resonance imaging (MRI). After noting that there is **exuberant growth** of brain cells during the prepuberty years and then a **pruning** time during adolescence, Dr. Giedd and others hypothesize that

stimulating brain activity during these years is critical.

The capacity to be skilled in many different areas is building up during those times. But the pruning-down phase is perhaps even more interesting, because our leading hypothesis for that is the 'use it or lose it' principle. Those cells and connections that are used will survive and flourish. Those cells and connections that are not used will wither and die. So if a teen is doing music or sports or academics, those are the cells and connections that will be hard-wired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going [to] survive.<sup>5</sup>

In short, for students to learn to think critically, solve complex problems, and be successful with a wide variety of tasks, schools must challenge them to practice complex tasks and strengthen the brain's capacity to engage in those thinking activities. In response to students who complain that they will not need algebra later in life, teachers can reply that brain research shows that solving complex algebraic problems will help students' brains retain the cells needed to solve complex problems later in life.

## Related Links

- [Caught in the Middle](#) (PDF; Outside Source)
- [Characteristics of middle grades students](#), Document Library, TCSII.
- [Fundamentals for Student Success in the Middle Grades, Characteristics of Young Adolescents](#) (PPT; 16 slides; 7:10; Outside Source ), National Middle School Association (NMSA).
- [Janet Zadina Index](#), Professional Learning Activities, TCSII.
- [Passionate Pupils: Using Brain Research to Engage Learners](#) (Outside Source), William McBride. *ASCD Express*.

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### Footnotes

<sup>1</sup>Rick Wormeli, "[Misleading in the Middle: A Rebuttal to Cheri Pierson Yecke](#)," *Educational Leadership*, Vol. 63 (Summer 2006).

<sup>2</sup>Lucinda M. Wilson and Deborah A. Corpus, "[The Effects of Reward Systems on Academic Performance](#)" (Outside Source), *Middle School Journal*, Vol. 33, No. 1 (September 2001), 56-60.

<sup>3</sup>Ken C. Winters, [Adolescent Brain Development and Drug Abuse](#) (PDF; Outside Source). Philadelphia: Treatment Research Institute, 2004.

<sup>4</sup>[Adolescence, Brain Development and Legal Culpability](#) (PDF; Outside Source), Washington, D.C.: Juvenile Justice Center, American Bar Association, Criminal Justice Section, January 2004.

<sup>5</sup>[Inside the Teenage Brain: An Interview with Jay Giedd](#) (Outside Source). Frontline; PBS Online.

<sup>6</sup>Caught in the Middle. Sacramento: California Department of Education, 1989.

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## Adolescent Needs

Young adolescents are developmentally different from elementary school children and from older high school students. Therefore, their educational needs are different as well. It is true that students from kindergarten to high school have unique needs. Middle grades students are no exception with their confusing and rapidly changing emotions and bodies. Middle school philosophy (Caught in the Middle summary of [Middle School Philosophy](#)) highlights strategies that respond to the specific developmental needs of adolescents.

Developmentally responsive middle schools effectively use research on the characteristics of middle grades students. Staff members understand that adolescents typically need specific types of experiences and opportunities during this stage of development. The following list of adolescent needs<sup>1</sup> is derived from the work of national middle school reform initiatives, including the [National Forum to Accelerate Middle School Reform](#) (Outside Source), [Turning Points](#) (Outside Source), and [This We Believe](#) (Outside Source). According to the findings, adolescents need:

- Approval and success
- Fairness
- Opportunities for voice<sup>2</sup>
- Experimentation
- Opportunities to make connections with peers<sup>3</sup>
- Autonomy<sup>4</sup>
- Belonging<sup>5</sup>
- Opportunities to create personal meaning and to engage in meaningful work



## In the Spotlight

### Seven Hills Intermediate School, Nevada City Elementary School District, a 2009 California Distinguished School

Seven Hills Intermediate School is featured on the California Department of Education's (CDE) Closing the Achievement Gap Web site for its Signature Practice, **Bicycle Recycle**. This exemplary practice addresses relevance, one of the CDE's 12 Recommendations for Middle Grades Success.

As a counselor at Seven Hills Intermediate, Steve Davis worked with middle grade students struggling with family, peer, substance abuse, and school issues. He found them reticent to speak to him in fear that they would be labeled as **weird**. Davis felt students might be more apt to connect with him if he could relate to them in a relevant way. That premise—the school's need for more career technical classes—and Davis' passion for bicycles made for a perfect combination and Bicycle Recycle was born.

Started as an elective class with 15 students, Bicycle Recycle made its home in a storage area in the back of the school gym. The program's goal was to teach students to rebuild and recycle bicycles as well as develop specific skills that could be applied in their daily lives. After completing a month-long study program, each student selected a bicycle in disrepair and renovated it. A student could keep it, donate it to a friend or family member, or give it to a nonprofit community agency. A culminating service-learning project required students to spend one morning repairing bikes belonging to the homeless.

The class enhanced students' environmental awareness while teaching technical skills and developing mechanical knowledge. Problem solving and working cooperatively with others were important components of the program. Most importantly, students who had not been successful in academic endeavors were offered the opportunity to experience success outside the traditional arena while still in an academic environment.

As the program enters a tenth year of operation, the results have been remarkable:

- The number of students seeing Davis for counseling increased by 65 percent as has the intervention success rate.
- One hundred percent of participating students indicated that Bicycle Recycle was a major contributor to their positive attitude and achievement in school.
- The number of bikes built and donated to nonprofit groups grew to between 80 and 120 annually.

Seven Hills Intermediate is one of the schools featured on the CDE's Closing the Achievement Gap Web site. The site contains helpful information, research, and success stories including Signature Practices from some of California's Distinguished Schools.

- [Seven Hills Intermediate School DataQuest Profile](#)
- [Seven Hills School](#) (Outside Source)
- [Signature Practice: Bicycle Recycle](#) (PDF; Outside Source)
- [California Distinguished Schools](#)
- [Closing the Achievement Gap's School Profile: Seven Hills Intermediate School](#) (Outside Source)
- [Practices In the Spotlight Index](#)

The Positive Classroom is a two-part special report that includes advice for educators on strategic ways to motivate students. Part I examines the effects teaching strategies have on students and explores new technologies that can help create positive classrooms. Part II reviews best practices and research about classroom strategies that meet the needs of different ethnic and economic groups.

## Related Links

- [The Positive Classroom](#) (Outside Source), Educational Leadership, September 2008.
- [ASCD Special Report: The Positive Classroom \(Part 1\)](#) (Outside Source), ASCD Smart Brief, September 2008.
- [ASCD Special Report: The Positive Classroom \(Part 2\)](#) (Outside Source), ASCD Smart Brief, September 2008.

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**Footnotes**

<sup>1</sup>Linda Inlay, "Safe Schools for the Roller Coaster Years," *Educational Leadership*, Vol. 62, No. 7 (April 2005), 41-43.

<sup>2</sup>Susan Black, "Listening to Students," *American School Board Journal*, Vol. 192, No. 11 (November 2005).

<sup>3</sup>Kathryn R. Wentzel, "Social Relationships and Motivation in Middle School: The Role of Parents, Teachers, and Peers," *Journal of Educational Psychology*, Vol. 90 (1998), 202.

<sup>4</sup>Wim Beyers, Luc Goossens, Els Moors, and Ilse Vansant, "[A Structural Model of Autonomy in Middle and Late Adolescence: Connectedness, Separation, Detachment, and Agency](#) (Outside Source)," *Journal of Youth and Adolescence*, Vol. 32 (2003), 1.

<sup>5</sup> [Getting Results Update 5](#), California Department of Education, 43.

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## Developmentally Responsive Middle Grades Practices

Quality middle grades programs respond to the needs of adolescents. A synthesis of research from *This We Believe: Successful Schools for Young Adolescents* and *Turning Points 2000* indicates that a middle school will respond to adolescent developmental needs in the following ways:

- Allow students to move around the classroom as long as they do not disrupt learning.
- Provide access to food and water during the day.
- Recognize physical changes as normal.
- Provide a wide variety of learning experiences.
- Teach students how to accept self and others.
- Encourage abstract thought.
- Provide interesting, challenging curriculum.
- Give students practice in planning.
- Support and encourage new social awareness and physical changes.
- Build positive relationships between adults and students.<sup>1</sup>

As noted in the section on adolescent needs, fairness is important to middle grades students. For example, students notice if a school gives fair access to co-curricular activities such as field trips, team memberships, and awards. Conversely, students also notice when schools apply policies inconsistently. In those cases, students may perceive, if they do not have all of the facts about the case, that some individuals or groups have been unfairly targeted for negative consequences such as suspensions, detentions, or expulsions.

The National Forum to Accelerate Middle Grades Reform developed criteria for high performance. The criteria are used as the basis for self-study by middle schools seeking to improve their practice and by all potential applicants and schools designated as Schools to Watch™. The National Forum to Accelerate Middle Grades Reform lists ten criteria for distinguishing a developmentally appropriate middle school. The School Self-Study and Rating Rubric is a tool designed by the Schools to Watch™-Taking Center Stage program to help schools analyze their progress toward excellence based on the National Forum's criteria.

1. The staff creates a personalized environment that supports each student's intellectual, ethical, social, and physical development.
  - Adults and students are grouped into smaller communities (e.g., teams, houses, academies) for enhanced teaching and learning.
  - These small learning communities are characterized by stable, close, and mutually respectful relationships.
  - Every student has a mentor, adviser, advocate, or other trustworthy adult and stays in relationship with that adult throughout the middle school experience.
2. The school provides access to comprehensive services to foster healthy physical, social, emotional, and intellectual development.
  - Teachers are trained to recognize and handle student problems.
  - Students with difficulties, and their families, can get help.
  - The school houses a wide range of support—nurses, counselors, resource

- teachers—to help students and families who need special assistance.
- The school staff members offer parent education activities involving families.
3. Teachers foster curiosity, creativity, and the development of social skills in a structured and supportive environment. All teachers:
    - Enhance standards-based learning by using a wide variety of instructional strategies and technology.
    - Incorporate well-developed procedures and routines for effective classroom management.
    - Facilitate learning by deliberately teaching study and organizational skills.
    - Integrate creative activities in the lessons (e.g., current technologies, visual and performing arts, etc.).
  4. The curriculum is both socially significant and relevant to the personal and career interests of young adolescents.
    - Students talk about daily issues in their own lives, their community, and their world.
    - Students take action, make informed choices, work collaboratively, and learn to resolve conflicts.
  5. Teachers use an interdisciplinary approach to reinforce important concepts and skills and address real-world problems. For example:
    - Students may read a historical novel for language arts and history and then study music from the same time period in music class.
    - Students can work on the same project in several different classes.
  6. Students are provided multiple opportunities to explore a rich variety of topics and interests in order to develop their identity, learn about their strengths, discover and demonstrate their own competence, and plan for their future.
    - Teachers and counselors push students to challenge themselves and set high academic and career goals for their future.
  7. All students have opportunities for expressing a voice—posing questions, reflecting on experiences, and participating in decisions and leadership activities.
    - All students have a real say, or have legitimate representation, in what happens at school.
    - School staff members have an “open-door” policy to encourage student involvement and connection.
    - Students take an active role in school-family conferences.
  8. The school staff members develop alliances with families to enhance and support the well-being of the children.
    - Parents are more than just volunteers or fund-raisers; they are meaningfully involved in all aspects of the school.
    - Parents are informed, included, and involved as partners and decision makers in their children’s education.
  9. Staff members provide all students with opportunities to develop citizenship skills, to use the community as a classroom, and to engage the community in providing resources and support.
    - Students take on projects to improve their school, community, state, nation, and world.
  10. The school provides age-appropriate, co-curricular activities to foster social skills and character and to develop interests beyond the classroom environment.
    - Student co-curricular activities cover a wide range of interests—team sports, clubs, exploratory opportunities, service opportunities, and the visual and performing arts.
    - Activities include both boys and girls and students of all skill levels.



## In the Spotlight

### **Rincon Intermediate School, Rowland Unified School District**

Based on recommendations from their district's Middle School Task Force, Rincon Intermediate School initiated several developmentally responsive practices. The school created an on-site Teen Center that provides after-school guidance, homework help, and fun activities. Staff members also participate in the district professional training on developmental responsiveness. To address the adolescent need for fairness, behavioral expectations are included in student planners and the parent handbook. In addition, the homeroom teachers engage students in discussing the importance of the behavioral expectations for community safety and health.

- [Rincon DataQuest School Profile](#)
- [Rincon Intermediate School](#) (Outside Source)

## Related Links

- [Adolescent needs](#), Recommendation 4— Relevance, TCSII.
- [Fundamentals for Student Success in the Middle Grades](#) (Outside Source) National Middle School Association.
- [Schools to Watch™-Taking Center Stage](#), California Department of Education.
- [Student perceptions about their competence](#), Recommendation 4— Relevance, TCSII.

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<sup>1</sup> [Fundamentals for Student Success in the Middle Grades](#) (Outside Source). Alexandria, Va.: National Middle School Association, n.d.

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## Personalized environment and opportunities for student voice

Giving students a voice in school (and life) decisions builds leadership and thinking skills at the same time that it engages students as active members of the school community. Some ways that schools can encourage student voice are as follows:

- Ask students to suggest themes, books, and topics to study (especially during the advisory program or homeroom period).
- Encourage students to discuss homework policies.
- Engage students in debate about teen issues, such as the dress code, cell phone use, proper Internet usage, and curfews.



### In the Spotlight

#### Del Dios Middle School and Mission Middle School, Escondido Union School District

These two middle schools have a popular reading program targeted for adolescent males. The program, started by two AmeriCorps volunteers, takes place once a week during the lunch break. High interest reading material was purchased with donations obtained through a Reading is Fundamental campaign. The program uses the reading list compiled by noted children's author Jon Scieszka and posted on the Web site *Guys Read*. The reading list includes scary stories, sport stories, and other genres of particular interest to middle school boys. Students select, read, and discuss the stories together, learning from each other in the process. The program has been so successful that more adult volunteers are being sought so it can be expanded to other middle schools in the district.

- [Del Dios Middle School DataQuest School Profile](#)
- [Del Dios Middle School](#) (Outside Source)
- [Mission Middle School DataQuest School Profile](#)
- [Mission Middle School](#) (Outside Source)
- [Practices in the Spotlight Index](#)

Allowing for student voice makes schools more democratic, and democratic schools tend to have fewer discipline problems, more civic involvement, higher student engagement, and higher achievement.<sup>1</sup>

## Related Links

- [Advisory programs](#), Recommendation 5—Relationships, TCSII.
- [Zadina 1—Brain Matters: Research on Learning](#), Professional Learning Activity, TCSII.
- [Zadina 2—Adolescent Characteristics \(Part I\): The Survival Instinct and the Development of the Brain](#), Professional Learning Activity, TCSII.
- [Zadina 2—Adolescent Characteristics \(Part II\): The Social Nature of the Brain and the Role of Emotion](#), Professional Learning Activity, TCSII.

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<sup>1</sup> Susan Black, "Listening to Students," *American School Board Journal*, Vol. 192, No. 11 (November 2005).

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## Student perceptions about their competence

Research indicates that student engagement and student perceptions about their own competence have a significant impact on learning. A 2006 study by MDRC (a nonprofit, nonpartisan social policy research organization) found interesting data that “perceived academic competence may be more influential than engagement in boosting achievement in both mathematics and reading.” The study concluded that if students believe they are competent, that belief has a stronger influence on subsequent participation than merely involving them in learning activities.<sup>1</sup>

Other research indicates that when adolescents believe in their own abilities to a high degree and value the tasks assigned to them, that belief appears to influence academic performance. At least two studies referenced in *Academic Achievement in the Middle Grades: What Does the Research Tell Us?* suggest that students benefit from placement in a higher-level course than would otherwise be the case. Researchers found that when 24 **average** middle grades students moved into a high-stretch mathematics class, they performed at a correspondingly higher level. In fact, several earned higher grades and test scores than their **high-achieving** classmates, and the group went on to take substantially more advanced mathematics during high school than the remaining **average** students.<sup>2</sup>

### Related Link

- [MDRC](#) (Outside Source)

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[Cross-curricular connections: writing across the curriculum](#)

#### Footnotes

<sup>1</sup> Theresa M. Akey, [Student Context, Student Attitudes and Behavior, and Academic Achievement: An Exploratory Analysis](#) (PDF; Outside Source). New York: MDRC, January 2006, iii.

<sup>2</sup> [Academic Achievement in the Middle Grades: What Does the Research Tell Us?](#) (PDF; Outside Source), Atlanta, Ga.: Southern Regional Education Board, 2003, 6.

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## Cross-curricular connections; writing across the curriculum

Students who use information they have learned in different contexts tend to remember that information longer. Using skills across disciplines also builds student confidence. Students are able to demonstrate success when they apply a skill. As a result, cross-curricular connections are extremely important for reinforcing learning and for building life-long learning skills.



### In the Spotlight

#### Alvarado Intermediate School, Rowland Unified School District, a 2004 Schools to Watch™-Taking Center Stage Model School

Alvarado Intermediate School uses interdisciplinary teaming to strengthen cross-curricular connections that reinforce essential standards. This structure gives the students a sense of belonging and allows for teacher dialogue and planning during a common preparation period. Staff members in every department and course develop and implement strategies for supporting the schoolwide targets of writing, reading, and mathematics identified in the annual school plan.

- [Alvarado DataQuest School Profile](#)
- [Alvarado Intermediate School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Alvarado Intermediate School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)



### In the Spotlight

#### Rincon Intermediate School, Rowland Unified School District

Eighth-grade students take on the role of an immigrant arriving at Ellis Island. They choose a name, research the country and culture of the arriving immigrant, and go

through a simulated entry to America. At the end of eighth grade, students complete a research project and presentation focused on one aspect of the history curriculum that includes science, math, and physical education history.

- [Rincon DataQuest School Profile](#)
- [Rincon Intermediate School](#) (Outside Source)

Many subjects are ripe for cross-curricular connections. For example, [capoeira](#) (Outside Source) (definition from online *Merriam-Webster Dictionary*) is a Brazilian martial arts/dance that includes culture, music, and physical activity. Students in a history class could do a project about capoeira, which would teach students about culture, blend the visual and performing arts, and build in relevance as students learn about how slaves **hid** martial arts training in a dance form. (The [visual and performing arts standards](#) [PDF; 2MB; 172pp.] call for knowing dances of different countries, the culture, and social history of the dances.)



## In the Spotlight

### **McKinleyville Middle School, McKinleyville Union Elementary School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

In the integrated math and physical science lessons, students create and launch rockets, use old CDs to create race cars, and graph velocity and weight using **Bungee Barbies**.

### **Olive Peirce Middle School, Ramona Unified School District, a California Middle Grades Partnership Network School**

Olive Peirce Middle School used a commercial, cross-curricular writing program for three years. At the end of that period, 93 percent of the students scored at the proficient level on the language arts portion of the CST.

- [McKinleyville DataQuest School Profile](#)
- [McKinleyville Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: McKinleyville Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)
  
- [Olive Peirce DataQuest School Profile](#)
- [Olive Peirce Middle School](#) (Outside Source)
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## Library media centers

Students in the middle grades must write research papers, which makes access to libraries and computer centers essential. In addition, library media centers provide an inviting environment where students can explore, work on projects, and receive assistance from trained library staff members. School libraries are more important than ever for supporting rigorous, standards-based learning. For example, a study by Keith Lance (1994) found that students whose library media specialists played an **instructional** role tended to achieve higher average test scores.<sup>1</sup>

Although the average national ratio of library media teachers to students is 1:870, California ranks 51st in the nation with a ratio of 1:4,541 (2002-03 California Basic Educational Data System [CBEDS] Report and Digest of Education Statistics and Tables and Figures, National Center for Education Statistics, 2002). Statistics about California School Libraries indicate that in the 2003-04 school year, only 20 percent of California schools had a credentialed library media teacher on campus part time or more, and the majority of professional staffing was found at the high school level. A library media teacher has both a California teaching credential and a California library media teacher services credential.

School library funding comes under the umbrella of the School Library and Improvement Block Grant.



### In the Spotlight

**Gaspar de Portola Middle School, San Diego Unified School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

Gaspar de Portola's library media center is the heart of the campus. Students read on sofas, browse stacks, and type on computers. The center is available to students and their families every weekday, beginning 70 minutes before school until 30 minutes after school.

**Rancho Milpitas Middle School, Milpitas Unified School District, a 2005 Schools to Watch™-Taking Center Stage Model School and 2005 California Distinguished School**

The school librarian at Rancho Milpitas Middle School works with teachers to develop literature circles online. This project provides students with several choices for book studies and an online chat group (monitored by the teachers) for discussing the book.

- [Gaspar de Portola DataQuest School Profile](#)
- [Gaspar de Portola Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Gaspar de Portola Middle School](#) (PDF; Outside Source)

- [Schools to Watch™-Taking Center Stage](#)
- [Rancho Milpitas DataQuest School Profile](#)
- [Rancho Milpitas Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Rancho Milpitas Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)
- [California Distinguished Schools](#)

The Scholastic document *School Libraries Work!* provides the following data to support the value of libraries:2

- In a 2002 Florida study, middle schools that provide 60 hours per week or more of staffing for their library programs experienced a 3.3 percent improvement in test scores over those staffed less than 60 hours.
- Pennsylvania middle schools with the best reading scores spend twice as much on their school libraries as the lowest scoring schools.
- Higher library staffing levels correlate to higher reading performance for all grade levels, and stronger writing performance at the elementary and middle school levels.
- Schools with newer collections (recently published books) average almost 13 percent higher eighth-grade writing scores.
- Students in Alaska's secondary schools with full-time teacher-librarians were almost twice as likely as those without teacher-librarians to score average or above-average on California Achievement Tests (CAT5).
- The more often students receive library/information literacy instruction from library media specialists, the higher the test scores.



## In the Spotlight

### **Richard Henry Dana Middle School, Wiseburn Elementary School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

The library media center is a vibrant learning resource that includes a computer lab. The staff members greet students with a warm welcome as they come to do homework, read, and work on class projects. The AVID class uses the center extensively to teach research and study skills.

- [Richard Henry Dana DataQuest School Profile](#)
- [Richard Henry Dana Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Richard Henry Dana Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)

## Related Links

- [Adolescents Read!](#) (PDF; Outside Source), New York Life Foundation Newsletter, Issue

2, January 2006.

- [California School Library Association](#)" (Outside Source)
- [CalEdFacts](#), California Department of Education.
- [Digest of Education Statistics, National Center for Education Statistics, 2002](#) (Outside Source)
- [Library Frequently Asked Questions about School Libraries](#), California Department of Education.
- [Model School Library Standards For California Public Schools, Kindergarten Through Grade Twelve](#) (DOC; 144KB; 20pp.), California Department of Education.
- [School Libraries](#), California Department of Education.
- [School Library and Improvement Block Grant](#) (established by Assembly Bill [AB] 825, Chapter 871, Statutes of 2004.)
- [Statistics about California School Libraries](#), California Department of Education.

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#### Footnotes

<sup>1</sup> Keith C. Lance, "[The Impact of School Library Media Centers on Academic Achievement](#)" (Outside Source), *School Library Media Quarterly*, Vol. 22, No. 3 (Spring 1994).

<sup>2</sup> [School Libraries Work!](#) (PDF; Outside Source) New York: Scholastic Library Services, 2008, 12, 13, 16-17.

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## Academic enrichment centers

**Academic enrichment** refers to activities that engage student interests, aptitudes, and abilities while reinforcing academic learning. The No Child Left Behind Act provided funds for 21st Century Community Learning Centers to provide disadvantaged K-12 students (particularly students who attend schools in need of improvement) with academic enrichment opportunities and supportive services to help the students meet state and local standards in core content areas. Academic enrichment centers are important extensions of the regular school program. Examples of academic enrichment activities include learning new computer software applications, carrying out research projects, studying a foreign language, and creative writing, including publishing original work.

Although academic enrichment centers may be especially attractive to gifted and talented students, schools serving disadvantaged students can provide exciting learning opportunities to all students through the enrichment center.

Effective middle schools employ highly qualified staff members for the enrichment centers. To ensure compatibility with the regular school program, enrichment center supervisors work closely with the content teachers and guidance personnel and encourage all students to take advantage of enrichment opportunities.

### Related Links

- [21st Century Community Learning Centers](#), California Department of Education.
- [After School Education & Safety Program](#), California Department of Education.
- [Before & After School Programs](#), California Department of Education.
- [Instruction, Assessment, and Intervention](#), Recommendation 2—Instruction, Assessment, and Intervention, TCSII.
- [Nutrition and fitness](#), Recommendation 8—Safety, Resilience, and Health, TCSII.
- [Partnerships with the Community](#), Recommendation 12—Partnerships, TCSII.

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## Electives and exploratory courses (interest-based)

Interest-based electives are part of what makes the middle grades experience special. For the first time, students have a choice of which classes to take. They also begin to exercise autonomy while exploring personal interests and possible career choices.

The **exploratory wheel** is a common elective choice primarily for first-year students to the school. The exploratory wheel rotates several subjects during a one- or two-semester course, thereby exposing students to a variety of new experiences. Exploratory wheel electives often include short classes in art, music, drama, technology, foreign language or culture, food science, or other areas of specialty represented on the faculty. Exploratory classes offer students a range of opportunities or experiences that they may want to pursue in the future. Typically, sixth-grade students have an opportunity to select the seventh-grade electives they would like to take, unless they are required to take intervention classes.

Some schools offer a **power wheel** as a support class for all students who need academic and behavioral support. When the power wheel is scheduled at the same time as an elective wheel, it provides the opportunity to move between a selected wheel and the power wheel. The opportunity to move from a power wheel into interest-based classes can motivate students to work hard and keep up their grades.

The following examples demonstrate a two-semester schedule that includes a power wheel and possible exploratory wheel configurations. These classes may be offered at the same time, allowing students to move from one half-semester offering to another. (Some classes may have prerequisites, making it difficult for students to move from one themed wheel to another.)

Power Wheel Configurations	Half Semester	Half Semester	Half Semester	Half Semester
Student Skill Building	Study skills	Reading/Math Support	Adolescent/Leadership skills	7th - Health and family life 8th - Life skills
Performing Arts	Drama sampler	Choir sampler	Debate	7th - Health and family life 8th - Life skills
Performing Arts	Beginning band	Beginning band - continued	Debate	7th - Health and family life

				8th - Life skills
Integrated Technology	Digital Literacy	Computer applications	Integrated technology lab or robotics	7th - Health and family life 8th - Life skills
Arts and Humanities	Arts and crafts	Publications	Community service	7th - Health and family life 8th - Life skills
Arts and Humanities	Foreign language	Foreign language - continued	Community service	7th - Health and family life 8th - Life skills
Career – Technical Education	The <a href="#">Real Game</a> , <a href="#">CareerZone</a> (PDF; Outside Source)	Broadcast reporting – School TV and podcasting	Culinary skills	7th - Health and family life 8th - Life skills
Science Sleuth	Eye in the sky (astronomy)	Big Dig (archaeology)	Forensics (crime scene investigation)	7th - Health and family life 8th - Life skills
Get Moving	Hip-hop and line dance	Drum and drill Team	Swimming at the high school or surfing at the beach	7th - Health and family life 8th - Life skills
Academic Enrichment	Science Fair	History Day	Odyssey of the Mind	7th - Health and family life 8th - Life skills



## In the Spotlight

**Alvarado Intermediate School, Rowland Unified School District, a 2004 Schools to Watch™-Taking Center Stage Model School**

The administration and staff at Alvarado developed exploratory and advanced elective courses that use students' talents and accommodate students' interests. Alvarado offers a variety of elective classes and exploratory classes that allow

students to display their skills through performances, competitions, and projects.

- [Alvarado DataQuest School Profile](#)
- [Alvarado Intermediate School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Alvarado Intermediate School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)

Many middle schools serving low-achieving students face the challenge of eliminating electives and exploratory wheel classes so that they can focus on reading and math. However, it is possible to make room for electives—even in state-monitored schools that double math and reading periods.

- Before- and after-school electives, such as band, choir, and art, provide enrichment for students who cannot take them during the day.
- Academic enrichment centers provide options for students to explore specific interests, such as technology applications, outside the school day.



## In the Spotlight

### **Lee Middle School, Woodland Joint Unified School District**

Students at Lee Middle School may choose a zero period elective option titled “Career Exploration.” The elective is taught by a staff member whose main responsibility is career counseling. In addition to exploring various career options, students learn about budgeting, work ethic, and personal responsibility. Students from the Career Exploration classes assist with the school’s yearly Career Day as part of their class assignments. This high-profile event draws dozens of speakers from the community who provide “career talk” presentations in every classroom. For more information on programs used in this elective class, visit the Career technical education section.

- [Lee Middle School DataQuest School Profile](#)
- [Lee Middle School](#) (Outside Source)
- [Career technical education](#)

Clubs, can focus on career-related subjects outside the school day.



## In the Spotlight

### **Gaspar De Portola Middle School, San Diego Unified School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

Electives include technology, media, Spanish, computers, cooking and sewing, band, art, and consumer and family studies classes. A late bus schedule allows students to

participate in after-school drama, the "6-to-6" program (available from 6 a.m. to 6 p.m.), sports, and other activities.

**Toby Johnson Middle School, Elk Grove Unified School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

Electives at Toby Johnson always come in block period four. Seventh graders choose from art, band, computer technology, and public speaking. Eighth graders have a much wider selection: computer technology, video production, criminology, theater, choir, Spanish, 3-D art, consumer/family life, public speaking, leadership, or math support.

- [Gaspar De Portola DataQuest School Profile](#)
- [Gaspar De Portola Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Gaspar De Portola Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)
  
- [Toby Johnson DataQuest School Profile](#)
- [Toby Johnson Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Toby Johnson Middle School](#) (PDF; Outside Source)
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## Related Links

- [Academic enrichment centers](#), Recommendation 4—Relevance, TCSII.
- [Relationship building through student clubs and connections](#), Recommendation 5—Relationships, TCSII.

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## Gaining relevance through visual and performing arts

“Creativity is as important in education as literacy . . . If you are not prepared to be wrong, you'll never come up with anything original.”<sup>1</sup>

Infusing the arts into the middle grades experience can meet the developmental needs for experimentation and for self-expression . “Learning in the artistic disciplines relies heavily on [experience], as do apprenticeships, and the school of hard knocks . . . Discovering and uncovering what we know is the most powerful learning; it goes deep and resonates for a long time.”<sup>2</sup>

The visual and performing arts tend to be highly engaging for many middle school students and help excite them for learning. For example, a three-year study by the Guggenheim Museum found that students in the program performed better in several categories of literacy and critical thinking skills—including extended focus, hypothesizing, and providing multiple interpretations—than did students who were not in the program.<sup>3</sup>

- However, according to a 2006 study by SRI International, an independent research institute, only 11 percent of public schools in the state offer students all four of the standards-based art courses—music, visual arts, theatre, and dance. State law requires that schools offer art instruction in all four disciplines, yet three in ten schools do not provide any courses in the standards-based art curriculum. Commissioned by the William and Flora Hewlett Foundation, the study included enrollment data from the California Department of Education and case studies on 31 schools. The study also included survey results from 1,123 schools across the state.<sup>4</sup>
- **Student-centered** is a concept characterized by teachers who conduct all planning, teaching, and assessment around the needs and abilities of their students—the clients and focus of a learning-based culture. Student-centered middle schools turn every corridor and public space into a gallery of student work, including poems, short stories, murals, paintings, drawings, and photographs of dramatic presentations. Many schools work with community partners to showcase videos and to provide CDs and DVDs of students in performances as a way of highlighting the connection between the arts and student engagement in learning.

Theatre and drama have particular relevance for adolescents as they explore possible identities, moral dilemmas, self-confidence, and their own creative talents. Theatre also helps students understand social relationships, gain conflict resolution skills, and engage in problem-solving strategies.

### Related Link

- [Personalized environment and opportunities for student voice](#), Recommendation 4—Relevance, TCSII.

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**Footnotes**

<sup>1</sup> Sir Ken Robinson's [speech](#) (WMV; Outside Source) at the Technology Entertainment Design (TED) conference in Monterey, California, February 2006. (author of *Out of Our Minds: Learning to Be Creative* and *Epiphany*).

<sup>2</sup> Eric Booth, *The Everyday Work of Art: Awakening the Extraordinary in Your Daily Life*. Lincoln, Neb.: iUniverse, 2001.

<sup>3</sup> [Solomon R. Guggenheim Museum: Teaching Literacy Through Art](#) (PDF; Outside Source) New York: Solomon Guggenheim Museum, April 2007.

<sup>4</sup> [An Unfinished Canvas—Arts Education in California: Taking Stock of Policies and Practices](#) (PDF; Outside Source). Menlo Park, Calif.: SRI International, January 2007, 14.

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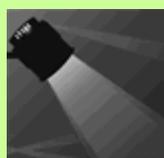
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## Real-world connections

Effective middle grades teachers find ways to help students apply what they have learned to solve real-world problems and to engage them as lifelong learners. According to research, “Young adolescents need varied learning activities linked to challenging academic content and opportunities to use new skills and concepts in real-world applications.”<sup>1</sup> Research also shows that one way teachers demonstrate caring for their students is by assigning work that matters [to the student].<sup>2</sup> Hands-on projects and real-world learning experiences motivate students to learn.



### In the Spotlight

#### Templeton Middle School, Templeton Unified School District

Students at Templeton helped plan and run mock elections attended by more than 330 students. The mock election—designed to be as much like the national elections in November as possible—did not include local races but did cover statewide offices and propositions. Student participation was voluntary, and organizers boasted a 67 percent turnout during the lunch hour event. Those who participated received "I voted" stickers after casting their paper ballots in the staged election area on the softball field.

- [Templeton DataQuest School Profile](#)
- [Templeton Middle School](#) (Outside Source)

Cognitive research findings show that the ability to retain and understand knowledge grows when students make connections and analogies to what they already know. For example, a class studying the human cell compared the cell components to soccer: the nucleus was the referee because the nucleus controls the cell and the referee controls the game. The teacher compared the cell wall to the goalie, who keeps things out of the cell just as the wall provides a barrier.<sup>3</sup>



### In the Spotlight

### **Nobel Middle School, Los Angeles Unified School District**

An orienteering activity combines geography, cartography, and math skills to identify a specific location in the community. The sixth-grade math project called Market Place challenges students to create and oversee a business, produce a product, and sell it to the school community (proceeds go to a charity that is chosen by the students). A graphing project requires students to enlarge an ordinary object using scale drawing, ratios, and measurements.

- [Nobel DataQuest School Profile](#)
- [Nobel Middle School](#) (Outside Source)

Research on school dropouts reinforces the importance of real world learning:

Eighty-one percent of survey respondents [high school dropouts] said that if schools provided opportunities for real-world learning (internships, service-learning projects, and other opportunities), it would have improved the students' chances of graduating from high school. Outside studies have noted that clarifying the links between school and getting a job may convince more students to stay in school.<sup>4</sup>



## **In the Spotlight**

### **Reyburn Intermediate School, Clovis Unified School District**

The agriculture class is a hands-on elective that reinforces academics and helps students in this agricultural community prepare for jobs. Students conduct experiments (science), keep logs about animal growth and care (math), and write reports on their work (English/language arts). Class projects, such as an auction, also require students to use math skills to determine the lot, litter, and birth order of the animals as those variables affect sale prices. Similarly, using information about the age of the animals helps students determine nutritional needs and feeding amounts. High school students assist their younger peers as tutors, role models, and model auctioneers.

- [Reyburn DataQuest School Profile](#).
- [Reyburn Intermediate School](#) (Outside Source)

Many tools are available to help teachers create real-world relevance. For example, advisory classes provide a forum for teachers to encourage students in discussing issues that concern them. The Internet gives students many exciting options for creating meaningful projects. Learning tools can connect students to people and projects related to math and other areas.



## **In the Spotlight**

### **Gaspar De Portola Middle School, San Diego Unified School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

To connect learning to the real world, De Portola Middle School offers the Stock Market Game (math), a “Coffee House Anthology Night” (English), Civil War reenactments (history), labs (science), and student participation in creating a class syllabus in multimedia.

- [Gaspar De Portola DataQuest School Profile](#)
- [Gaspar De Portola Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: Gaspar De Portola Middle School](#) (PDF; Outside Source)

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#### **Footnotes**

<sup>1</sup> John M. Bridgeland, John J. Dilulio, Jr., and Karen Burke Morison, [The Silent Epidemic: Perspectives of High School Dropouts](#) (PDF; Outside Source), a report by Civic Enterprises in association with Peter D. Hart Research Associates for the Bill & Melinda Gates Foundation, March 2006, 12.

<sup>2</sup> Preston D. Feden, Robert M. Vogel, and Robert Mark Vogel, *Methods of Teaching: Applying Cognitive Science to Promote Student Learning*. N.p.: McGraw-Hill, June 2002.

<sup>3</sup> [Academic Achievement in the Middle Grades: What Does the Research Tell Us?](#) (PDF; Outside Source), Atlanta, Ga.: Southern Regional Education Board, 2003, 19.

<sup>4</sup> Linda Darling-Hammond and Olivia Ifill-Lynch, “[If They'd Only Do Their Work! Helping Struggling Students](#),” *Educational Leadership*, Vol. 63, No. 5 (February 2006), 8-13.

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## Career technical education

Career technical education at the middle-grades level prepares students for options in high school and beyond. It helps to connect some of the seemingly unrelated middle-grade lessons to a career that may ultimately be of interest to the student and become a catalyst for learning. Beyond the traditional career fair, middle schools can incorporate career exploration into their elective wheels and integrate the career technical education standards into interdisciplinary lessons.

In 2006, the California Department of Education released the Career Technical Education Model Curriculum Standards for grades seven through twelve to guide educators in developing career connections for students. In the same year, the State Superintendent of Public Instruction's P-16 Council, in its Report on High School Reform issued the following recommendation:

In the long run, success in high school would be greatly enhanced if an academic or a career plan or both, starting in middle school through the postsecondary level, were required for all students. The plan must identify the college or career pathway, or both, associated with each student's goals and be reviewed annually and modified as needed throughout high school.<sup>1</sup>

In the Career Technical Education Model Curriculum Standards (2006) details of about 15 industry sectors of interrelated occupations and broad industries are given. Each sector has two or more career pathways.

California CareerZone is an interactive Web site designed especially for students to explore careers. Users complete one of three self-assessment exercises. The Web site then produces a list of potential jobs from a database of 900 occupations with information on wages, worker attributes, job characteristics, and links to 300 videos that give users a snapshot of the featured occupation. There are also links to actual job openings. California CareerZone also provides users with budgeting information. The Reality Check option helps users assess how much education they need to get a good job and how much money they will need to earn to live well.

The Real Game California™ is a Web-based career-development curriculum that offers hands-on role simulations in the classroom where students learn self-management, decision making, and the relevance between their education and real jobs. The curriculum aligns with California's content standards, Equipped for the Future Content Standards for Adult Literacy and Lifelong Learning, career technical education standards, and other national guidelines. A multi-state, multi-year evaluation of The Real Game Series involving over 600 students from 12 schools in five states shows positive outcomes for participating students. Among the findings presented in The Real Game Evaluation Results were:

- Significant strengthening of students' understanding of the knowledge, skills, and abilities necessary to succeed in the workplace.
- Positive impacts on students' goal setting abilities and confidence in their future success.
- An increase in students' engagement in school.
- Positive impacts on students' sense of self-efficacy.

The Real Game Series consists of teaching materials to help students connect what they are learning in the classroom to future careers. Curriculum materials are available at every grade level, K-16.

Students as young as middle graders wonder, "What do I want to do with my life?" Several years ago, four college friends who were unsure about their career paths asked the same question. To find the answer, the four embarked on a cross-country tour in an old, green RV—interviewing inspiring people along the way. Today, Roadtrip Nation has been featured in a Public Broadcasting series, the subject of several books, and the center of a growing online community.

The goals of Roadtrip Nation include connecting students with the real world by broadening student exposure to pathways and opportunities related to their interests and empowering them to define their path. Annie Mais, Education Director, notes that Roadtrip Nation curriculum has been included in Advancement Via Individual Determination (AVID), incorporated in English language arts classes, and is an integral part of some after-school programs in California middle schools. In addition to providing information that is both interesting and relevant, the project helps students connect to teachers, peers, and their community.

Who Do U Want 2B? is a career exploration Web site developed by the California Department of Education, the California Community Colleges, and the State of California. It features videos of successful young adults who tell about the choices they made leading to new careers. In addition, it offers information about pay levels by job category.



## In the Spotlight

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**Lee Middle School, Woodland Joint Unified School District**  
Lee Middle School launched both The Real Game California™ and the California CareerZone to help students see the relevance of their academic experience by drawing a connection between future aspirations and current class work.

- [Lee DataQuest School Profile](#)
- [Lee Middle School](#) (Outside Source)

## Related Links

- [California Career Resource Network](#) (CalCRN) (Outside Source), State of California.
- [California Career Technical Education Model Curriculum Standards](#) (PDF; 2MB; 441pp.), California Department of Education.
- [Career Technical Education](#), California Department of Education.
- [CareerZone California](#) (Outside Source), California Career Resource Center (CalCRN).
- [California P-16 Council Report and Recommendations on High School Reform](#) (PDF; 109KB; 17pp.). California Department of Education.
- [Roadtrip Nation](#) (Outside Source)
- [State Superintendent of Public Instruction's P-16 Council](#), California Department of Education.
- [The Real Game California™](#) (PDF; Outside Source), CalCRN.
- [The Real Game Evaluation Results](#) (PDF; Outside Source)
- [The Real Game Series](#) (Outside Source)

- [Who Do U Want 2B?](#) (Outside Source)

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**Footnote**

<sup>1</sup> [California P-16 Council Report and Recommendations on High School Reform](#) (PDF; 109KB; 17pp.). Sacramento: California Department of Education, January 2007, 11.

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## Project-based learning

Research about authentic instruction indicates, "Teachers should encourage students to actively 'construct knowledge' for themselves, participate in 'disciplined inquiry' and pursue learning that has 'value beyond the school.'"<sup>1</sup> This project-based learning responds to developmental needs. "Middle grades students abound with kinetic energy. Those who teach at the middle levels know that active, hands-on learning has strong appeal for young adolescents. The 'doing' part of content standards lends itself to projects and activities that students can work on in groups or as individuals. When the 'do' part of the standard is explicit, students understand clearly what is expected of them, and it is an instructional target the teacher can assess."<sup>2</sup>



### In the Spotlight

**Catherine Zane Middle School, Eureka City Unified School District**

To encourage learning, Zane Middle School gives students responsibility. For example, students took 90 percent of the responsibility for running a service-learning conference in April 2006. The 2007 tech conference was 100 percent student-led. In addition, the school received recognition from the district and surrounding area for the following practices: electives, transitions, and student clubs and connections.

**McKinleyville Middle School, McKinleyville Union Elementary School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

To encourage a deep understanding of history, the school engages students in Civil War Days (supported by the music program), Renaissance Days, Roman chariot races, Greek Olympics, Supreme Court hearings, the Underground Railroad, colonial bartering, and mock trials. Students also join in townhall meeting discussions about the Fugitive Slave Act and the Stamp Act.

**Nobel Middle School, Los Angeles Unified School District**

Sixth-grade science teachers use lava lamps to demonstrate convection currents. Students use cake frosting and graham crackers to explore fault movement. Physical science students create a wall-sized, three-dimensional periodical chart, and all students are invited to submit articles to the school literary magazine.

- [Catherine Zane DataQuest School Profile](#)
- [Catherine Zane Middle School](#) (Outside Source)
- [McKinleyville DataQuest School Profile](#)
- [McKinleyville Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: McKinleyville Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)

- [Nobel DataQuest School Profile](#)
- [Nobel Middle School](#) (Outside Source)

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**Footnotes**

<sup>1</sup> [Academic Achievement in the Middle Grades: What Does the Research Tell Us?](#) (Outside Source) Atlanta, Ga.: Southern Regional Education Board, 2003, 8.

<sup>2</sup> *Taking Center Stage*. Sacramento: California Department of Education, 2001, 25.

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## Service-learning

Community service-learning (also called service-learning) is an educational process that integrates students' academic learning with service that meets actual community needs. It combines two effective approaches to education and youth development: experiential learning and community service. Evaluations of California's statewide service-learning efforts have demonstrated their positive impact on students, teachers, school climate, and on communities.<sup>1</sup> Research by Melchior (1999) demonstrated that service-learning has positive effects in the areas of personal and social development. In addition, he reports that evidence suggests that students participating in service-learning are gaining academic proficiency at high levels.<sup>2</sup> In addition, results from a recent statewide study involving 68 California classrooms indicated that 82.9 percent of the participating students met or exceeded the proficiency level on the California academic content standards being delivered through service-learning. Middle and high school student participants showed higher learning of math content than did the comparison group after participation in service-learning. Researchers found that middle school students who engaged in quality service-learning programs showed increases in personal and social responsibility, communication, and a sense of educational competence. Researchers also found improved problem-solving skills, as well as increased interest in academics. Middle and high school students who participated in service-learning tutoring programs were less likely to drop out of school and increased their grade point averages.<sup>3</sup>



## In the Spotlight

### **McKinleyville Middle School, McKinleyville Union Elementary School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

Students lead yearly relief projects. Past projects have included raising money to help victims of 9-11, the Southeast Asian tsunamis, and hurricanes Katrina and Rita. Students and teachers also participate in beach clean-ups, creek restoration, and community trail construction.

- [McKinleyville DataQuest School Profile](#)
- [McKinleyville Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: McKinleyville Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)

Service-learning transforms young people from adolescents into serious, caring, thoughtful young adults because they are needed, are involved in a meaningful activity, and are discovering talents that they never knew they possessed.<sup>4</sup>



## In the Spotlight

### **Catherine Zane Middle School, Eureka City Unified School District**

The school's Environmental and Spatial Technology (EAST) lab uses technology to solve real-life issues around the school and community. Students choose personally meaningful projects. For example, the Eureka Skate Park group sold ice cream to raise money for the city to build a skate park to keep skaters safe. The community Kids Care group held fund-raisers for leukemia patients and the Red Cross. The hurricane relief group held a coat and canned food drive. The Talent Show group organized a talent show to raise money to buy backpacks and school supplies for students affected by Hurricane Katrina. In 2006, students collected over 1,000 pounds of canned food for the Salvation Army, over \$1,000 for hurricane relief, and sent 35 backpacks full of school supplies to a school in Louisiana.

### **Luther Burbank Middle School, Burbank Unified School District**

Eighth-grade history students at Luther Burbank Middle School learned about the Constitution and the functions of governments through service-learning. For example, they explored their communities, identified problems, and tried to make a positive change in public policy. One problem they identified in the community was that teens were not being judged by a jury of their peers in the courts. They researched the process teens undergo when breaking the law and the best way to prevent repeat offenses. Students then collaborated with personnel from the City of Burbank, the Burbank Unified School District, and the Burbank Police Department to gather information through interviews. Using the information they gathered, they created a display showing the problem and presented alternative solutions through the development of a new public policy. Their final action was to promote the implementation of a teen peer court program.

Through their research, students became aware of offenses committed most often by teens, along with the different jobs associated with law enforcement and the judicial system. Students learned that they can impact the legal system and participate in the political process. Student assessment results indicated that 88 percent of the students achieved proficiency in the history-social science standards addressed in this activity.

### **Redwood Middle School, Saratoga Union Elementary School District**

Eighth- grade students at Redwood Middle School developed a peer-tutoring program for elementary students. In the program, middle-school students tutor elementary students one-on-one. The younger students enjoy working with a role model, and the older students practice their leadership skills. The enterprising students honed their speaking skills to sell their idea to both the district superintendent and to the board of trustees, who granted approval for their service-learning project. Under the approved plans, students conduct the tutoring sessions on early dismissal days when the teachers collaborate on lessons.

- [Catherine Zane DataQuest School Profile](#)
- [Catherine Zane Middle School](#) (Outside Source)
  
- [Luther Burbank DataQuest School Profile](#)
- [Luther Burbank Middle School](#) (Outside Source)
  
- [Redwood Middle DataQuest School Profile](#)
- [Redwood Middle School](#) (Outside Source)

To promote critical thinking, students need the opportunity to construct their own knowledge and make use of that knowledge by applying it. A skillfully crafted service-learning activity allows the teacher to present **ill-defined questions** and help students learn problem-solving skills. Students learn to refine these questions and organize their thinking process to solve the problem. Service-learning allows students to **learn how they learn best** and how to use multiple learning styles to think critically while addressing a community need or issue.

Educators who have used service-learning to promote student engagement often find that the best career explorations occur when youths are allowed to work alongside of adults doing real work to meet real objectives. When students participate in a service-learning project, they usually do so with the involvement of adults in the workforce. Students learn about the jobs that adults do and the kind of preparation necessary to work in the field.



## In the Spotlight

### **Monte Vista Middle School, Tracy Joint Unified School District**

The seventh- and eighth-grade students at Monte Vista created a California native plant garden in a waste area behind some classrooms. The students wanted to share the garden with the younger students and create a guide that informed them not only of the plants in the garden but a variety of plants native to California. They also needed a fund-raiser to help buy supplies for the garden and help keep it self-sufficient. The students decided to make a coloring book that would describe all of the plants in the garden and help people become aware of other plants native to California. The students decided to make extra copies to sell to parents and community members to raise funds for the garden. They also wanted to give away copies to the lower grades to help spark interest in California native plants.

Students researched recycling issues and presented their findings to the entire school once a week for a semester during the **Monday Morning Meeting News Updates**, a regular element of the weekly schoolwide assembly. Students met the science standards by addressing the language arts standards through their oral and written presentations.

Planners evaluated the success of the project based on the response from other students and teachers throughout the school. Most feedback was positive and the end-of-the-year schoolwide waste audit showed a solid improvement over the beginning of the year.

- [Monte Vista DataQuest School Profile](#)
- [Monte Vista Middle School](#) (Outside Source)

## Related Links

- [CalServe](#), California Department of Education.
- [Going EAST: Student and Teacher POVs](#)" (Outside Source), Edutopia.
- [Service-Learning](#), California Department of Education.
- [Service Learning: The Classroom Companion to Character Education](#) (PDF; Outside Source), Arlene Ida and Jean Rose, K- 16 Initiatives and Access Program, New York State Education Department.

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**Footnotes**

<sup>1</sup> *Resilience & Youth Development Module: Aggregated California Data: Fall 1999-Spring 2002*. Prepared by the Safe and Healthy Kids Office and WestEd. Sacramento: California Department of Education, 2003, 47.

<sup>2</sup> A. Melchior, [Summary Report: National Evaluation of Learn and Serve America](#). Waltham, Mass.: Center for Human Resources, Brandeis University, 1999.

<sup>3</sup> [California Service-Learning District Partnerships: Statewide Summary Report of Local Evaluations, 2005-06](#) (DOC; 616KB; 80pp.). Sacramento: California Department of Education, 7.

<sup>4</sup> Sandra Krystal, "The Nurturing Potential of Service-Learning," *Educational Leadership*, Vol. 56 (December 1998/January 1999).

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## Multicultural experiences

California has one of the most diverse populations in the United States. This multicultural diversity provides teachers with a rich source of opportunities to teach about geography and culture while fostering interpersonal skills needed in the global economy. Teachers can weave a range of cultural perspectives throughout the curriculum and into the school community. Such multicultural connections not only make education more relevant for students who see their cultures recognized, they also reinforce studies in English language arts, history, geography, and the arts. For example, students can compare the moral and ethical dilemmas, story structure, standards of beauty, and specific characters in various versions of similar stories or historical events.<sup>1</sup>

Although debates about the value of multicultural education continue, there is little research that definitively **proves** its effect on student achievement. Anecdotal evidence strongly suggests that students respond favorably to teachers who recognize and value the contributions of many cultures. Criteria from the National Forum to Accelerate Middle Grades Reform promote effective schools characterized by the following features:

- Ongoing opportunities for students to learn about and appreciate their own and others' cultures.
- Valuing knowledge from the diverse cultures represented in the school, community, and nation.
- The use of materials in the media center representing cultures of all the students.
- Opportunities for families to come and share their traditions and beliefs.
- The use of multicultural materials and methods and expression of multiple viewpoints.

School staff members can build cultural awareness through a wide variety of activities and practices:

- Staff training and recruiting (staff is aware of student cultures and, if possible, reflects the student diversity).
- Parent and family cultural events on special days and festivals (include food, clothing, dance, songs, stories).
- Curriculum materials and the library/resource materials (Remove old materials if they include stereotypes and update with stories and materials that reflect many cultures).
- Programs designed to help students appreciate and understand diversity.
- School newsletters and other communications printed in the predominant languages of the community.



### In the Spotlight

**Rio Norte Junior High School, William S. Hart Union High School District**

As a part of a districtwide focus on diversity and multicultural sensitivity, Rio Norte

staff members conduct a diversity exercise that engages the students in physical movement, social interaction, and learning. In each small learning community, teachers gather students in the gym or outside and give them a list of cultural events, places, and historical figures that they must **find** as in a treasure hunt. They find the treasures by interviewing teammates to find out what they know about the treasure. When one is **found**, students place their teammate's name beside the item. In later debriefing sessions, students can elaborate on the person, food, or event so that students learn even more about their teammate and another culture.

- [Rio Norte DataQuest School Profile](#)
- [Rio Norte Junior High School](#) (Outside Source)

## Related Links

- [Multicultural Education](#) (Outside Source), College of Education, University of Washington.
- [Multicultural Education](#) (Outside Source), North Central Regional Educational Laboratory.
- [Resources](#), California Department of Education.

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### Footnote

<sup>1</sup> G. Ladson-Billings, "[Educating for Diversity: What We Can Learn from Multicultural Education Research](#)," *Educational Leadership*, Vol. 51, No. 8 (1994).

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## Meaningful participation

According to the Healthy Kids Resilience and Youth Development Module<sup>1</sup> (a summary of resilience research), meaningful participation involves students in relevant, engaging, and interesting activities with opportunities for responsibility and contribution, and is a natural outcome of high expectations. Among other things, resilience research shows that:

- Participation, like caring and support, allows students to have some control and ownership over their own life and learning.
- Positive developmental outcomes—including reductions in health-risk behaviors and increases in academic factors—are associated with youths who hold valued responsibilities, planning and decision-making opportunities, and chances to contribute to and help others in their home, school, and community environments.
- In schools with low levels of delinquency and school failure, students participated actively in school events. When treated as responsible people, they reacted accordingly.
- Surveys of adults who had avoided poverty, teen pregnancy, and drug abuse and had graduated from high school showed a high correlation between their success as adults and their reported empowerment as participants in directing their learning when they were students.
- Meaningful participation means that the classroom and school must become a democratic community.
- Meeting students' needs to have some control and a sense of participation, or belonging, usually prevents students from disconnecting from the school. Alienation is a behavior that the National Longitudinal Study of Adolescent Health has found plays a significant role in students' involvement in problem behaviors.
- Give students more opportunities to respond to questions.
- Ask students for their opinions on issues and classroom problems.
- Create study circles in which students engage in a democratic process for sharing their thoughts and concerns on a particular issue.
- Give students a choice of assignments and books to read.
- Have students create the classroom rules and procedures.
- Ask questions that encourage self-reflection, critical thinking, and dialogue—especially around salient social and personal issues.
- Make learning more hands-on.
- Involve students in curriculum planning.
- Use participatory evaluation strategies.

The module contains the following list of suggested school-based strategies for engaging students in meaningful participation:

- Create many opportunities for creative expression through art, music, drama, writing, and storytelling.
- Use cooperative learning.
- Establish peer helping/tutoring and cross-age mentoring/tutoring programs.
- Provide community service-learning.
- Infuse adventure learning into curriculum and after-school programs, groups, and clubs.
- Use restorative justice circles in place of punitive discipline. (Restorative justice is a

**payback** concept that requires offenders to compensate those whom they have hurt. For example, if students ruin someone's belongings, they must replace them. Restorative justice encourages dialogue and responsibility for past behavior while focusing on future problem solving and offender accountability.)

- Engage students—especially those on the margin—in a school climate improvement task force.
- Use project-based learning.
- Use experiential learning.



## In the Spotlight

### **McKinleyville Middle School, McKinleyville Union Elementary School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

Twice a year, students at McKinleyville participate in a student-led parent conference, an article on the EducationWorld Web site, using the model developed by Stiggins.<sup>2</sup> Students make presentations to their family members about their progress toward achieving the California standards in oral and written language. Students present their accomplishments and future goals, supported by work samples, and together with their parents or guardians, they evaluate performance according to a rubric based on standards for each of their courses.

- [McKinleyville DataQuest School Profile](#)
- [McKinleyville Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: McKinleyville Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)
- [Student-led Parent Conferences: A Growing Trend](#) (Outside Source), Education World: The Educator's Best Friend™
- [EducationWorld®](#) (Outside Source)
- [Accountability through student-led parent conferences](#), Recommendation 11—Accountability, TCSII.

[The California Healthy Kids Survey](#) gives seventh-grade students an opportunity to participate in shaping the school community as they express their concerns and indicate sources of support and caring from their school communities.

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#### **Footnotes**

<sup>1</sup> Resilience & Youth Development Module: Aggregated California Data: Fall 1999 –Spring 2002. Sacramento: California Safe and Healthy Kids Office and WestEd, 2003.

<sup>2</sup> R. J. Stiggins, *Student-Centered Classroom Assessment*. New York: Macmillan Publishing Company, 1994.

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## Leadership opportunities

Students grow in both social and emotional confidence when they contribute as leaders. For example, students can serve as technology tutors for school personnel.<sup>1</sup>

### Related Links

- [Student leadership](#), Recommendation 9—Leadership, TCSII.

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<sup>1</sup> Cordelia Twomey and Joanne Schleiche, "Students as Teachers: Helping Administrators Attain Technology Skills," *Educational Leadership*, Vol. 7, No. 9 (June 2004).

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## Field trips

Field trips have the potential to provide all students, particularly those from low socioeconomic backgrounds, with mind-stretching experiences. Those experiences expose students to a world and community beyond where they live. Field trips may also be the impetus for continued learning and can bring **book learning** to life. Novel and multisensory experiences stay with students for a long time. They may lead to future career choices. Field trips are expensive, require excellent supervision, and a great deal of advance planning (learning goals, related activities, permissions, lodging, food, and transportation). However, they have the potential to provide an invaluable learning experience for students.



### In the Spotlight

**Gaspar De Portola Middle School, San Diego Unified School District, a 2006 Schools to Watch™-Taking Center Stage Model School**

All sixth graders participate in a standards-based, outdoor education program for one week at Camp Palomar, where students mingle with those from other schools and participate in science, social studies, and race/human relations activities.

- [Gaspar De Portola DataQuest School Profile](#)
- [Gaspar De Portola Middle School](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage— Model School-Visitor's Guide: Gaspar De Portola Middle School](#) (PDF; Outside Source)
- [Schools to Watch™-Taking Center Stage](#)

Field trips are not out of the question even when budgets are tight. Funding from parent teacher clubs, student fund-raisers, and community organizations can make field trips accessible to all students. Additionally, students may benefit from **virtual** field trips. According to the results of a scientifically based research study, there are free collections of virtual (online) field trips and other Web-based learning materials that have demonstrated results in boosting reading levels and helping to improve test scores among middle-school students.

Assemblies offer another alternative to field trips. For example, some museums, theater groups, zoos, and wildlife sanctuaries provide on-site experiences for the entire student body. In some cases, Gifted and Talented Education funds can be used to provide these types of experiences for all students. Schools can contact mobile science labs or groups such as Civil War re-enactors or others who bring history to life in a multimedia, live-action presentation.

## Related Links

- [Online field trips boost reading scores](#) (Outside Source) from *eSchool News*, May 19, 2005.

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## Integrating technology

Educational technology offers much promise for making learning more relevant to students. However, it is important to remember that learning goals drive the selection of technology tools. For example, an online game in history will help students only if the content of the questions reflects grade-level standards. In addition, technology purchases must be tied to the [School's Single Plan for Student Achievement](#) and the district's state-approved [technology plan](#).

Three questions will help to guide educators in integrating technology:

- How is student learning different because of technology?
- How is your teaching different because of technology?
- What evidence supports the effectiveness of the technology in improving student engagement in learning?

For the most part, American adolescents are **technology natives** who were born into the world of computers, the Internet, cell phones, blogs, and e-mail. **Millennials** are children born between 1980 and 2000.<sup>1</sup> For most of these students, technology tools and games are a way of life. School professionals can uncover a multitude of opportunities to engage these technology natives by using the learning tools that matter to them. (Also, refer to [Acceptance of Young Adolescent Priorities Leads to Reciprocal Identification with Academic Values](#), Appendix 5-B from the original *Taking Center Stage*.)

According to the federal No Child Left Behind Act, students should be technology literate by the time they complete eighth grade. A successful, technology-rich school must integrate technology into the curricula, and teachers need training to use the technology and maximize its potential.<sup>2</sup>

However, one aspect of the achievement gap is that students in low-income families often do not have equal access to technology, particularly at home, leading to a **digital divide**. Providing technology for use by teachers and students can be a challenge, but many schools—even those from the poorest neighborhoods—have been successful in acquiring technology through grants, community partnerships, Title I funding, and donations. For more information on funding for technology, go to the California Department of Education (CDE) Web page on [education technology](#).

The State of California currently has no technology standards for students, although technology is embedded within the academic content standards. For example:

- [Grade six, English language arts standards 1.4 and 1.5](#) in Research and Technology—states: “Use organizational features of electronic text (e.g., bulletin boards, databases, keyword searches, e-mail addresses) to locate information. Compose documents with appropriate formatting by using word-processing skills and principles of design (e.g., margins, tabs, spacing, columns, and page orientation).”
- [Grade seven, the English language arts standard 1.6](#) in Research and Technology—states: “Create documents by using word-processing skills and publishing programs; develop simple databases and spreadsheets to manage information and prepare reports.”
- [Grade eight, the English language arts standard 1.4](#)—Research and Technology—

states: "Plan and conduct multiple-step information searches by using computer networks and modems."

- [Grade six, the science strand Investigation and Experimentation, standard 7b, states:](#) "Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data." (Grade seven includes the same language in standard 7a.)

The [Environmental and Spatial Technology \(EAST\)](#) (Outside Source) Initiative began in 1996 and now includes 230 schools in six states, including California. EAST has been recognized nationally as an innovative, relevant, and successful approach to education by the U.S. Department of Education and the Department of Labor.<sup>3</sup> EAST combines the power of cutting-edge technology, authentic teamwork, and significant community service to help students develop their own interests and aptitudes in a positive environment. It is typically offered as an elective class taught before or after school.

Dedication to service is central to EAST. All students are encouraged, expected, and required to work in teams on self-selected community service projects, where they apply their technology. This model empowers students to become good citizens and leaders.

EAST students are equipped with the tools of the future. They routinely interact with hardware and software in animation, computer-aided design, engineering design, visualization, database design, Web page design, programming, office automation, digital filmmaking, virtual reality, global positioning systems, and geographic information systems. Through EAST, they connect to a support network that spans the country and includes peer mentors, facilitators from across the country, EAST national support staff, and business and educational partners. For more information about this initiative, refer to the [Environmental and Spatial Technology](#)—CDE Web site or the [EAST Initiative](#) (Outside Source).

[Breaking Ranks in the Middle](#) (PDF; Outside Source) recommendation number 30 underscores the importance of making technology available for all students: "Schools will develop a strategic plan to make technology integral to curriculum, instruction, and assessment, accommodating different learning styles and helping teachers to individualize and improve the learning process."<sup>4</sup>

Research on the use of school and home computers showed gains in student achievement. Penuel et. al. (2002) conducted a meta-analysis of 19 research articles about the effects of computers on improving home-school connections. "Technology integration programs designed to improve home-school connections typically result in:

- **A modest increase in student reading ability.** However, this improvement is smaller than in other sorts of intervention programs, such as class-size-reduction, computer-assisted instruction, tutoring, individualization, increased homework, coaching for achievement tests, and parental involvement programs.
- **A substantial increase in student writing ability.** This improvement is comparable in size to that typically found in integration programs that stress computer-assisted instruction and is also larger than the effect sizes associated with intervention programs that stress class-size reduction, individualization, or coaching for achievement tests.
- **A modest increase in student mathematics ability.** This improvement is comparable in size to that typically found in integration programs that stress coaching for achievement tests and is larger than that typically found in class-size reduction, and individualization intervention programs.
- **Significantly improved communications between parents and school."**<sup>5</sup>



### **Maywood Middle School, Corning Union Elementary School District**

Students helped to install the school's Environmental and Spatial Technology (EAST) lab. They also maintain it and trouble-shoot any problems. Students interact with EAST-specified hardware and software in animation, computer-aided designs, engineering design, visualization, database design, Web page design, programming, office automation, digital filmmaking, virtual reality, and global positioning and geographic information systems. Students are motivated to work on projects that matter to them. In addition, they face problems similar to those they will face when they enter the workforce, including planning, time management, the need to work well with others, taking personal responsibility and problem solving. In solving these problems, "they learn to become creative, intuitive, adaptable learners who can solve unpredictable, real world problems."<sup>6</sup>

- [Maywood DataQuest School Profile](#)
- [Maywood Middle School](#) (Outside Source)
- [Environmental and Spatial Technology](#), California Department of Education.



## **In the Spotlight**

### **Carlsbad Unified School District**

Technology is used to promote student engagement in learning. Middle grades classrooms are equipped with ceiling-mounted projection devices, a document camera, Smartboards or interactive tablets, a teacher computer station, and a minimum of three student desktop computers. Wireless connections and more portable devices are included in the district's technology plan goals. Each middle school has a studio where student-created video bulletin broadcasts are streamed over the Internet.

The equipment and software for the studios was obtained through a combination of grants, corporate partnerships, and donations. As part of the elective program at the middle schools, students may choose the very popular semester course, Introduction to Broadcasting, then follow it with the yearlong, more in-depth courses, Broadcasting 1 and Broadcasting 2. Broadcasting provides an authentic way for students to practice and perfect their reading, writing and speaking skills.

Middle grades students in Carlsbad Unified also have the opportunity for another very popular technology-related activity—the Geocaching Club. Learning is combined with fun. Students use handheld Global Positioning Systems (GPS) units to search for hidden **treasure**. Besides the excitement of the hunt, students learn latitude and longitude coordinates, estimate and measure distance, graph, and work as part of a team.

- [Carlsbad Unified DataQuest Profile](#)
- [Carlsbad Unified School District](#) (Outside Source)
- [Geocaching Club](#) (Outside Source)

Although the term Web 2.0 suggests a new version of the [World Wide Web](#) (Outside Source), it actually means changes in the ways the existing Web can be used. Software developers

have created Web tools to allow a more personalized, interactive Web experience. Many of the Web tools and resources are free and require little more than a high-speed Internet connection and a receiver, such as a computer or a hand-held device.

The variety of Web 2.0 tools continues to expand with increasing numbers of options for [social networking sites](#) (Outside Source), [blogs](#) (Outside Source) (Web logs), [photo sharing](#) (Outside Source) and [image sharing](#) (Outside Source), [RSS](#) (Outside Source) (*Really Simple Syndication or Rich Site Summary*; several similar forms of Web syndication used by news Web sites and Weblogs), [newsfeeds](#) (Outside Source), [wikis](#) (Outside Source), real-time, online applications for group collaboration, [podcasts](#), and more. Although students seem to have no trouble maneuvering their way through this smorgasbord of technology, others—including some classroom teachers—may find jumping into Web 2.0 to be a daunting experience.

The California School Library Association has created a professional development tutorial to assist teachers with the use of Web 2.0 tools. [Classroom Learning 2.0](#) (Outside Source), is an on-line guide that will allow you to try out and experience Web 2.0 tools. The tutorial features 23 tasks to complete. Each task will showcase one more Web tool that you can use with students. In addition, the tutorial provides ideas on how to use these tools to motivate student learning.

Many teachers are experimenting with using new technology tools to enhance learning, including [podcasts](#), blogs, and video games. The following resources provide a few ideas to help teachers use technology effectively:

## Related Links

- [California Career Technical Education Model Curriculum Standards Grades Seven Through Twelve](#), (PDF; 4MB; 441pp.), California Department of Education.
- [Clearinghouse for Specialized Media and Technology](#), (CSMT), California Department of Education.
- [Computer-Using Educators, Inc. \(CUE\)](#), (Outside Source)
- [Education Technology](#), California Department of Education.
- [Education Technology K-12 Voucher Program](#), California Department of Education.
- [Environmental and Spatial Technology \(EAST\) Initiative](#), (Outside Source)
- [International Society for Technology in Education \(ISTE\)](#), (Outside Source)
- Sections that incorporate technology for teaching in Taking Center Stage—Act II include:
  - ◆ [Algebra](#), Recommendation 2—Instruction, Assessment, and Intervention , TCSII.
  - ◆ [English language arts instruction](#), Recommendation 2—Instruction, Assessment, and Intervention , TCSII.
  - ◆ [Ethics and plagiarism](#), Recommendation 1—Rigor, TCSII.
  - ◆ [Foreign/world languages](#), Recommendation 2—Instruction, Assessment, and Intervention , TCSII.
  - ◆ [History-social science instruction](#), Recommendation 2—Instruction, Assessment, and Intervention , TCSII.
  - ◆ [Science instruction](#), Recommendation 2—Instruction, Assessment, and Intervention, TCSII.
  - ◆ [Technology Support for Leaders](#), Recommendation 9—Leadership, TCSII.
  - ◆ [Visual and Performing arts \(VAPA\)](#), Recommendation 2—Instruction, Assessment, and Intervention , TCSII.
- [Standards](#) (Outside Source), Standards for Global Learning in the Digital Age, Information Society for Technology in Education.
- [Standards of Quality and Effectiveness for Professional Teacher Induction Programs](#) (PDF; Outside Source), California Commission on Teacher Credentialing, State of California.
- [Statewide Education Technology Services \(SETS\)](#), California Department of Education.
- [Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge](#),

- (PDF; Outside Source), Michigan State University, the *Teachers College Record*.
- [Today's Middle Level Educator Podcast Series](#), (Outside Source), National Middle School Association.

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### Footnotes

<sup>1</sup> Neil Howe and William Strauss, *Millennials Rising; The Next Great Generation*. New York: Vintage Books, 2000.

<sup>2</sup> Chad Vander Veen, "[Technology and the Three R's](#)" (*Outside Source*), *Government Technology* (June 1, 2006).

<sup>3</sup>"[Toward a New Golden Age in American Education](#)" (PDF; Outside Source) Washington, D.C.: U.S. Department of Education National Technology Plan, 2004, 33.

<sup>4</sup> [Breaking Ranks in the Middle: Strategies for Leading Middle Level Reform Executive Summary](#) (PDF; Outside Source). Alexandria, Va.: National Association of Secondary School Principals.

<sup>5</sup> W. R. Penuel et al., [Using Technology to Enhance Connections between Home and School: A Research Synthesis](#) (Outside Source). Washington, D.C.: Planning and Evaluation Service, U.S. Department of Education, Department of Health and Human Services, 2002.

<sup>6</sup> C. Jerome Crow, "Maywood Students on the Cutting Edge," *Red Bluff Daily News*, January 1, 2006.

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## Computer access

[The International Society for Technology in Education](#) (ISTE) (Outside Source) promotes a 1:1 student-to-computer ratio through its National Educational Technology Standards for Students (NETS) philosophy. However, although the student-to-computer ratio is dropping rapidly, the one-to-one ratio is still uncommon in California.

According to Education Week's [Technology Counts 2007](#) (PDF; Outside Source), the student-to-computer ratio in California schools is 5.1:1 and the student-to-Internet-connected computer ratio is 5.0:1. Almost 100 percent of classrooms in California are connected to the Internet. The U.S. average for instructional computer ratio is 3.8 and the Internet connection computer ratio is 3.7.<sup>1</sup>

Computers (desktop, laptop, and tablet PCs—or personal computers) are technology tools that open the world to young students. In addition, smartboards and handheld student response systems give instant feedback and engage students in learning. **One-to-one** computer programs allow students to check out a laptop to continue learning at home. When computers are linked through a server, student grade reports are accessible daily by parents/guardians and students. Electronic access to reports helps with continuous progress monitoring.



### In the Spotlight

**Maywood Middle School, Corning Union Elementary School District**

Teachers at Maywood Middle School routinely integrate technology to help engage students in their learning. The school has two on-site computer labs, with 35 computers in each lab. Technology is used in a variety of ways:

- Integrated intervention software is used with Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) students.
- Server-based language acquisition programs are used with English learners.
- Advancement Via Individual Determination (AVID) students use the computer to complete mock college applications and explore careers through the online California Career Zone.
- Students enrolled in the Environmental and Spatial Technology (EAST) elective use technology for productivity, research, and communication to complete community service projects.

One of the most successful ways technology has been used is through basic skills practice. Students enrolled in intervention classes enthusiastically learn basic skills with the help of software programs that mirror video game formats. Test results show that 80 percent of students enrolled in intervention classes who used this computer program moved up one band on the California Standards Test.

- [Maywood Middle School DataQuest Profile](#)
- [Maywood Middle School](#) (Outside Source)
- [Gaining Early Awareness and Readiness for Undergraduate Programs](#) (Outside Source)
- [Advancement Via Individual Determination](#) (Outside Source)
- [California Career Zone](#) (Outside Source)
- [Environmental and Spatial Technology](#) (Outside Source)

An article titled "[Tablet PCs in the Classroom](#)" (Outside Source), presents a **classroom of the future**, showing how students move in and out of groups with their tablet PCs and recommends uses such as the **minute paper** to jot down learning from the day's lesson.



## In the Spotlight

### **Lemon Grove Middle School, Lemon Grove Elementary School District**

Lemon Grove Middle School is one of the **Classrooms of the Future** in San Diego County. Students receive e-Pads, computers that they can take home and use at school. The district connects all students and their homes through a broadband **portal** that allows teachers to post content, assignments, and grades without the worry that students can access noneducational Web sites. The e-Pads weigh less than an average textbook and yet contain the contents for more than one book. In addition, the e-Pads allow students to work cooperatively on research projects or problems while the teacher monitors their work from a central instructor's terminal. Even students who are at home due to illness can participate in the lessons through their broadband connection.

- [Lemon Grove Middle School DataQuest Profile](#)
- [Lemon Grove Middle School](#) (Outside Source)
- [Classrooms of the Future](#) (Outside Source)

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<sup>1</sup> [Technology Counts 2007](#), (Outside Source) Bethesda, MD.: Editorial Projects in Education Research Center, 2007, 2.

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## Student interactive assessment and response remote systems

Students receive instant feedback on answers to questions in a format similar to a game show. Fast-paced yet private, the system stimulates engagement while minimizing embarrassment over incorrect responses. With handheld student response remote systems, teachers can devise quizzes to assess student understanding, call for student votes, and have students answer remotely. Teachers can also use the system to encourage questions through **privacy** response buttons. At the same time, the system records all responses in the teacher's computer or handheld device. (These systems are available through a variety of vendors—type **handheld student response remote systems** into an Internet search engine.)



### In the Spotlight

#### **John Glenn Middle School of International Studies, Desert Sands Unified School District, a 2004 Schools to Watch™-Taking Center Stage Model School**

Teachers provide each seventh-grade student in the Viking Academy with a handheld instant feedback student response system. Numbers on the handheld clicker electronically link to the grade book so that the teacher knows who posted the wrong answers, but students do not. Teachers can post standards-based quizzes on the overhead projector. As students click on the multiple-choice answers, the program automatically counts the number of **hits** per answer and projects those tallies, giving students instant feedback on the correct answer and on their own grasp of the subject.

The system has been a motivational tool for the students and a quick way for teachers to assess the need to reteach. The **real-time** aspect of the system is perfect for students and teachers as they both get instantaneous feedback on mastery of concepts. Students who need extra help but fear peer rejection can push a button to indicate that they have a question. The teacher sees which student hit the button and can talk to him or her later in private to work on helping the student understand the concept.

- [John Glenn DataQuest School Profile](#)
- [John Glenn Middle School of International Studies](#) (Outside Source)
- [Schools to Watch™-Taking Center Stage—Model School-Visitor's Guide: John Glenn Middle School of International Studies](#) (PDF; Outside Source)
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## Security issues related to technology

Security is an ever-changing but necessary feature of school-based technology. Technology security issues are discussed in relation to two of the other California Department of Education's 12 Recommendations for Middle Grades Success as follows:

- Student internet safety is discussed in Recommendation 8—Safety, Resilience, and Health, TCSII.
- Information on cyberbullying is also addressed in the section on Bullying Prevention, Recommendation 8—Safety, Resilience, and Health, TCSII.
- [Technology Support for Leaders](#), Recommendation 9—Leadership, TCSII.

### Related Links

- [Internet safety](#), Recommendation 8—Safety, Resilience, and Health, TCSII.
- [Recommendation 9—Leadership](#), TCSII.
- [Top Ten Cyber Security Tips for Teens, Their Teachers and Families](#) (PDF; Outside Source), CyberSmart Curriculum.

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## Podcasts

Podcasts are similar to radio shows that students download to a personal computer or an MP3 player. Podcasts appeal to these **technology natives**<sup>1</sup> and can enhance project-based learning. For example, student teams can develop podcasts to help peers review for exams and learn more about subjects. "Educators are starting to see how podcasting can help hone students' vocabulary, writing, editing, public speaking, and presentation skills . . . Students can also learn skills that will be valuable in the working world, such as communication, time management, and problem-solving."<sup>2</sup>

Students can use podcasts to interview civic leaders or people in subject-related careers or discuss study notes for upcoming exams. Through the advisory class, media exploratory, or student government class, students can also host forums for student comments on major teen issues and current events.

With a few pieces of hardware and free, readily available software programs, podcasts can be included as a fun way to engage and empower students in their own learning. According to teachers who use them, podcasts are another tool to create an environment in which students want to learn.<sup>3</sup>

### Related Links

- [Frequently Asked Questions About Podcasts](#) (DOC; 43 KB; 2 pp.), Document Library, TCSII.
- [How to Create a Podcast for Mac](#) (DOC; 2 MB; 4 pp.), Document Library, TCSII.
- [How to Create a Podcast for PC](#) (DOC; 2 MB; 4 pp.), Document Library, TCSII.
- [Nauset Technology News](#) (MP3; Outside Source), Technology news from the Nauset Public Schools.
- [Podcast rubric](#) (DOC; 41 KB; 1 p.), Document Library, TCSII.
- [Podcasting: Transforming Middle Schoolers Into 'Middle Scholars'](#) (Outside Source), *T.H.E. Journal*, December 2005.
- [The Education Podcast Network](#) (Outside Source)
- [Welcome to Podcast Central!](#) (Outside Source), Making Learning Irresistible for Over 25 Years, Mabry Online.

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<sup>1</sup> Neil Howe and William Strauss, *Millennials Rising; The Next Great Generation*. New York: Vintage Books, 2000.

<sup>2</sup> Rhea R. Borja, "Podcasting Craze Comes to K-12 Schools," *Education Week*, Vol. 25, Issue

14, (December 7, 2005), 8.

<sup>3</sup> Linda Man, "Podcasts Bring 24/7 Teachers," *The Kansas City Star*, Mar. 20, 2006.

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## Blogs

A blog is an online journal/Web site that allows online members to post notes and receive feedback. Several online blogs are popular with adolescents. Teachers use blogs to pose thought-provoking questions that will elicit a more reflective response than a simple answer. For example, writing teachers can use blogs to link adolescents' need to experiment with adolescents' love of technology.

Learning is, after all, intensely social, and blogs as social software are all about connecting and communicating. With a group course blog, individual blogs for each student, and plenty of time together talking, we build a committed learning community beyond the confines of the classroom, and reap the considerable rewards of collaborative learning.<sup>1</sup>

The public nature of blogs may encourage students to be careful about their grammar, particularly when teachers and parents comment on students' work. It also allows quiet students to have a voice.

Blogs pose challenges to educators and require considerable time and care. For example, teachers need to devote time to updating the course blog and responding to students. Time is also required to monitor each student's blog for appropriateness. In addition, some districts may block all commercial site blogs for safety and security reasons.

Teachers who have experimented with blogs have the following suggestions for other educators:

- Read many blogs to see what types of functions they can serve.
- Figure out the purpose of a planned classroom or team blog.<sup>2</sup>
- Share selected examples with students and discuss ground rules for participating in a project involving blogs.

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<sup>1</sup> Barbara Ganley, "[This Time, It's Personal: Elevating Creative Discourse Through Student Blogs](#)" (Outside Source), *ASCD Express* (January 2006).

<sup>2</sup> Dennis Pierce, "[Panelists: Blogs Are Changing Education](#)," *eSchool News* (Outside Source), March 24, 2006.

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## Online communities

As an alternative to blogs and to maintain security and provide safety from bullying, many districts are considering hosting online communities on the district server rather than on a commercial site. Several online sites allow districts to link students in online communities that are password-protected. For example, the [Oracle Education Foundation](#) (Outside Source), a nonprofit organization, hosts a free service for schools to develop online communities.

Teachers can develop an online community where students can obtain homework assignments, instructions, and grades. Some sites also allow students to correspond with the teacher or with each other. Online communities are usually password-protected, which provides a more secure environment than an open Web portal.

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## Teacher Web pages

Not all teachers in California have their own Web pages. However, Web pages are helpful for giving students and parents access to lessons, rubrics, documents, content-related Web sites, or other activities on their own time.



### In the Spotlight

#### Saddleback Valley Unified School District

Every teacher in the district is required to maintain a Web page through the district's portal. However, implementation of the Web sites varies considerably, depending on each teacher's comfort level with technology and time allocated to maintaining a current site.

- [Saddleback Valley DataQuest District Profile](#)
- [Saddleback Valley Unified School District](#) (Outside Source)

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## Web portals

Web portals are **gateways** to Internet sites that provide specialized features for members, including resources, Webmail, links to other sites, tutorials, and professional learning opportunities. The [Technology Information Center for Administrative Leadership](#) (TICAL) is an example of a portal that provides education-related forums and information about educational technology to school leaders. Both the [Association for California School Administrators](#) and the [California Middle Grades Partnership Network](#) use TICAL services to share information.

In “The New WWW: Whatever, Whenever, Wherever,” writer Tom March provides a list of steps for how to develop “A Class Act Portal,” including suggestions about online providers.<sup>1</sup>

Help in developing educational portals and wikis (a Web site that lets visitors add, remove, or edit content) include the following:

- An 11-minute presentation, [Web 2.0 Tools for Busy Administrators](#) (Outside Source), on TICAL provides a quick overview of what Web 2.0 is and then shares a concrete example of how a group of educators in northern California used an online group, a wiki, and a **Webtop** word processor to help them complete a collaborative planning process.
- The [Brokers of Expertise Web site](#) (Outside Source) contains examples of wikis. Use the Brokers' search function to find examples and a sample wiki rubric.

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<sup>1</sup> Tom March, “[The New WWW: Whatever, Whenever, Wherever](#),” *Educational Leadership*, Vol. 63, No 4 (December 2//5/January 2006), 14-19.

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## Online tutorials

Technology provides an invaluable assistant to teachers when students need extra time to master a concept. **Technology natives** often enjoy the independence of working at their own pace and getting instant feedback from computer-based tutorials. Many of the products use a game-like format that rewards students with systematic **victories** as they master concepts.



### In the Spotlight

#### Rio Norte Junior High School, William S. Hart Union High School District

The school uses a Web-based commercial mathematics tutoring program as an instructional extension. If students do not understand their homework, they can log on to the Web site and get instant tutorials in how to solve the problem.

#### Serrano Intermediate School, Saddleback Valley Unified School District

has experienced success using Assessment and Learning in Knowledge Spaces (ALEKS), an online mathematics tutorial program. .

- [Rio Norte DataQuest School Profile](#)
- [Rio Norte Junior High School](#) (Outside Source)
- [Serrano DataQuest School Profile](#)
- [Serrano Intermediate School](#) (Outside Source)
- [Assessment and Learning in Knowledge Spaces \(ALEKS\)](#) (Outside Source)

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## Student Web sites and Webcasts

Since Web design will continue to be a marketable skill for the near future, many schools are giving students a chance to participate in the school's Web design. Such involvement requires students to learn teamwork, math skills, design skills, and a technical language: HTML (HyperText Markup Language).



### In the Spotlight

#### Catherine Zane Middle School, Eureka City Unified School District

Students in the Environmental and Spatial Technology (EAST) lab use technology to complete projects and learn skills needed in the 21st century. For example, they study Web design, use animation software, and learn to use video and digital cameras. Students used a Web site design program to design the MAD lab Web site, a new Web site, for their school. In addition, students use project productivity programs to design project posters, journals, and presentations.

- [Catherine Zane DataQuest School Profile](#)
- [Catherine Zane Middle School](#) (Outside Source)
- [Environmental and Spatial Technology \(EAST\)](#)
- [Zane MAD Lab Web site](#) (Outside Source)

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## Web-based research

Students in the middle grades today have grown up with technology and feel very comfortable doing online searches. Before making an assignment that requires online research, however, teachers should make sure that students know how to evaluate the quality of the content they will encounter on the Web. Sites such as [Teacher Tap](#) (Outside Source), the [Sheridan Libraries](#) (Outside Source) from Johns Hopkins University, and [Discovery Education](#) (Outside Source) provide information on what students need to know about online research as well as how to teach these skills.

If students have never done a project that requires online research, teachers may wish to first start with a group project, such as a [WebQuest](#) (Outside Source) project, to provide structure.

A WebQuest is an inquiry-oriented activity that requires participants to draw most or all of the information from the Web. Students dig deeper on topics that interest them or find material for research projects. The WebQuest portal (sponsored by San Diego State University) includes examples of WebQuests as well as reading and training materials to help teachers design WebQuest projects.

Many Web sites link students to original documents. A few examples follow:

- [Calisphere](#) (Outside Source) is a University of California Web site that provides teachers with access to a digital library of primary sources, including pictures, speeches, and research.
- [Eyewitness to History](#) (Outside Source) is a site that links to personal accounts of history—from handwritten reports written by George Washington and Thomas Jefferson to Lady Bird Johnson's moment-by-moment, tape-recorded diary of President Kennedy's assassination in Dallas.
- [My Wonderful World](#) (Outside Source) is a National Geographic site that helps students learn about the world.
- [National Archives](#) (Outside Source) is a site that includes reproducible copies of primary documents and teaching activities with cross-curricular connections.
- [Smithsonian Archives of American Art](#) (Outside Source) is the world's largest primary source collection of the visual arts in America.
- [Smithsonian Source, Resources for Teaching American History](#) (Outside Source) includes teacher-selected resources, a searchable database, and lesson plans.

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## Distance learning

Although distance learning often means online degree programs or independent study, it is also a way to enhance learning beyond the classroom. For example, it might be one way to offer interest-based electives in rural schools that do not have access to specialists or to offer enriched learning options for gifted students. Distance learning also offers students a chance to connect with professionals in specialized fields or with people in other countries.

Over 1 million kindergarten through high school students were enrolled in virtual schooling across the nation, according to the [International Association for K-12 Online Learning \(iNACOL\)](#) (Outside Source) a nonprofit organization for administrators, teachers, and others involved in online schooling. Enrollment, counted as the total number of seats in all online classes, not the number of students, has grown twenty-fold in seven years, and the group expects the numbers to continue to jump 30 percent annually.<sup>1</sup>

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<sup>1</sup> Seema Mehta, "[More students across US logging on to online classrooms](#)," *Los Angeles Times*, February 18, 2007.

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## Simulations and Digital Gaming

The terms **simulation** and **digital game** are often used interchangeably. Simulation is an umbrella term that includes computer (digital) games, video games, and computer modeling. While all digital games may be considered simulations, all simulations are not games. As Frasca states, "games are just a particular way of structuring simulation, just like narrative is a form of structuring representation" (Frasca, 2003).

According to a 2007 survey conducted by the national education nonprofit Project Tomorrow, 51 percent of students surveyed said that electronic gaming made difficult concepts easier to understand. One reason for this may be that regular classroom instruction often presents information as abstract ideas, whereas gaming places the subject matter within a meaningful context. Students learn the new information and can immediately apply the practice they have learned in a virtual environment. This premise is support in the National Middle Schools Association (NMSA) article, Let the Games Begin (Outside Source), (Katherine C. Clark, 2008).

Computer software allows schools to offer interactive role-playing situations that challenge students, often using a game format. For example, games teach history, world geography, and urban design through virtual interaction. In science, computer simulations might enable students to conduct a [virtual frog dissection](#). In history, simulation-style computer games allow players to act as world leaders, make important decisions, and discover the consequences.

The National Center on Accessing the General Curriculum provides research on virtual reality, another form of simulation: [Virtual Reality/Computer Simulations: Curriculum Enhancement](#) (PDF; Outside Source). The Web site defines computer simulations and contrasts it with virtual reality. In addition, it provides applications across the curriculum areas.

In the *Harvard Education Letter*, James Paul Gee, author of *What Video Games Have to Teach Us About Learning and Literacy* (2003), argues that schools need to capitalize on students' interest in video games. He asserts that gaming teaches valuable lessons. "Game designers let players be producers, not just consumers. Players codesign a game through their unique actions and decisions."<sup>1</sup>

Many educators skeptical of the educational value of video games were surprised by the approval of the [Federation of American Scientists](#) (Outside Source), who agreed with Gee's conclusions. After a year of study, the group called for federal research on how to translate student fascination with video games into serious learning tools for schools. Their premise is that games teach skills that employers want: analytical thinking, team building, multitasking, and problem solving under duress.<sup>2</sup>

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<sup>1</sup> James Paul Gee, "The Classroom of Popular Culture: What Video Games Can Teach Us

About Making Students Want to Learn"(Outside Source), *Harvard Education Letter* (November/December 2005).

<sup>2</sup> [Summit on Educational Games: Harnessing the Power of Video Games for Learning](#) (PDF; Outside Source). Washington, D.C.: Federation of American Scientists, 2006.

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## Computer modeling

Whether we know it or not, the growing field of computer modeling is becoming a more integral part of our lives. From scientists who use computer modeling to predict the path of a hurricane to civil engineers who use the technology to determine the potential effects of removing a dam, computer modeling contributes to the knowledge we have about our world and about our specific environments.

Computer modeling is a simulation that assists students in understanding real-life complex systems or processes. The software provides a way of designing detailed, two or three dimensional models of objects such as mechanical parts, buildings, or molecules and then allows students to test various attributes or scenarios. For example, what would happen to a machine if a different-sized gear was substituted, or where should the library be placed to get the maximum amount of morning sun?

In the classroom, students learn to become architects and engineers by creating **virtual** designs. Also known as CAD—computer-aided design—computer modeling provides real-world experience without the need for costly materials.

### Related Links

- [Computer Modeling Smooths a Dam Hard Job](#) (Outside Source), WIRED.
- [Using Computer Models to Teach Complex Systems](#) (Outside Source), On the Cutting Edge.

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## Animation

Computer animation has captured the interest of many teens in recent years. Today, this technology can help students blend the arts with science by using animation to show a process such as mitosis, a physics principle in action, or a chemical reaction.



### In the Spotlight

#### Claremont Middle School, Oakland Unified School District

Thanks to a newly revitalized technology center, students at Claremont can create three-dimensional projects using animation software. In the fall of 2008, Claremont became one of the first middle schools in California to teach three-dimensional animation during the school day. Students can take the semester-long class during the regular school day or enroll in other after-school electives such as Tech Squad filmmaking and Web design programs (also offered on two middle school campuses in East Oakland: Frick and Havenscourt).

The technological transformation at Claremont didn't come from the school board, the district's curriculum department, or even the principal's office. According to a news article about the innovative program (Oakland school goes high-tech, Oakland Tribune, 1/30/09), the technology programs at Claremont are the result of tremendous efforts by parents and other volunteers. The community partners developed the vision, conducted fundraising events, and provided much of the set-up needed to launch the program.

In addition to the animation class, other planned offerings include: Film Making; Music and Sound Creation and Mixing; Digital Photography; Presentations and Spreadsheets; Web Site Creation.

- [Claremont DataQuest School Profile](#)
- [Claremont Middle School](#) (Outside Source)

## Related Links

- [Animation and Graphics](#) (Outside Source), EASTinitiative.

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## Videography

Increasingly, more middle schools have developed video classes to capitalize on student interest in drama and film. Presented as both an elective class and as an enhancement to core classes, videography and clay animation teach students skills in project management, scripting, teamwork, editing, filmmaking, storyboarding, and production.



### In the Spotlight

**Catherine Zane Middle School, Eureka City Unified School District.**

The local public access channel presented student-produced videos from Zane Middle School in November 2005. Teacher Margot Genger's video production class wrote, storyboarded, videotaped, and produced the videos. For example, *U.S. Congress 2000* is a 30-minute video of the eighth-grade U.S. history class. Andrea Tarantino's students studied how Congress works. They determined a budget, researched topics of interest, wrote bills, presented them to the House of Representatives and Senate, answered questions, and voted on whether to enact their bills into law.

- [Catherine Zane DataQuest School Profile](#)
- [Catherine Zane Middle School](#) (Outside Source)

## Related Links

- [Using Video Production to Improve Student Learning](#) (Outside Source), Poway Unified School District: EdTech Central.
- [You Oughta Be in Pictures: An introduction to Making Video](#) (Outside Source), Youth Learn: Technology, media & project-based learning to inspire young minds.

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## GIS/GPS—geographic information systems/global positioning systems

In 2006, the [National Research Council](#) (Outside Source) issued a report calling on schools to incorporate [spatial literacy](#) (Outside Source) into their curricula. According to the Council's report, "Learning to Think Spatially: GIS as a Support System in the K-12 Curriculum, [spatial thinking](#) is an increasingly important skill for living and working in the 21st century, and geographic information system (GIS) technology can help schools teach this skill to their students'.<sup>1</sup> Global Positioning Systems (GPS) are an important companion to geographic information systems, giving rise to the acronym GIS/GPS.

[The Environmental and Spatial Technology \(EAST\) Initiative](#) (Outside Source) is among the national leaders in geospatial education and training. EAST students have access to "industry standard" tools and training. Many software packages that are in EAST classrooms are industry-grade, and EAST students have access to industry standard tools. ESRI, a business partner's [virtual campus](#) (Outside Source), and a nationally lauded GIS/GPS support network with the [Center for Advanced Spatial Technology \(CAST\)](#) (Outside Source), provide technical support to EAST classrooms.

[My World](#) (Outside Source), sponsored by [Geographic Data in Education \(GEODE\) Initiative](#) (Outside Source), is a GIS program designed for use in middle school through college classrooms. For example, the Earth Structures and Processes unit corresponds to the grade six (Earth Science) standards to learn about plate tectonics and the shaping of the earth's surface.

Though GIS technology appears in the [National Geography Standards](#), teachers in earth, environmental, biological, and general science also are incorporating [geospatial technologies](#) into their lessons. The growing use of these tools in an array of social studies and Science Technology Engineering and Math (STEM) subjects supports authentic, problem-based instruction, helping students tackle real social and environmental research projects in their communities.<sup>2</sup>

Some teachers have begun to incorporate GPS technology in the classroom through geocaching. Geocaching is a high-tech treasure hunt using hand-held GPS devices. To see what GPS products are available, type 'handheld GPS devices; into any search engine to get a varied listing with prices and product reviews included.

Handheld GPS units are a novel addition to the classroom and make learning fun and engaging. To find lessons and ideas for using GPS units to enhance lessons in math, geography, science, and language, arts, see the Related Links below.

### Related Links

- [Bishop Dunne Catholic School GeoTech Conference](#), (Outside Source)
- [Geocaching](#),(Outside Source)
- [Geocaching with Kids](#), (Outside Source)
- [Geospatial Technologies](#), (Outside Source), EASTinitiative.

- [GPS and Geocaching in Education](#), (Outside Source)
- [Having Fun with GPS](#), (PDF; Outside Source), Monitoring Times.
- [National Research Council](#) (Outside Source) Committee on Geography. *Learning to Think Spatially: GIS as a Support System in the K-12 Curriculum*. Washington, D.C.: National Academy Press, 2006.
- [School Mapping Project](#), (Outside Source), EASTinitiative.

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<sup>1</sup> [“Researchers Call for Integration of GIS, Spatial Thinking in K-12 Curricula”](#) (Outside Source), *eSchool News*, April 2006.

<sup>2</sup> [“GIS and Geographic Inquiry”](#) (Outside Source), *eSchool News*

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## Conclusion

Relevance, along with rigor and relationships, is one of the key indicators of a high-performing middle grades program. Adolescents have reached a stage of development where they question authority, they are growing in the ability to reason, and they need to find meaning. Without that meaning—or relevance—these technology natives find it easy to tune out adults who seem to not understand them. Adolescents tune in to peers who help them make sense out of the world. Relevant middle grades programs meet students' needs for meaning and create excitement about learning how they fit into the challenging world of the future.



## In the Spotlight

### Frank Wright Middle School, Imperial Unified School District, a 2007 Schools to Watch-Taking Center Stage Model School

The staff members at Frank Wright Middle School have developed a comprehensive system of programs and support to ensure that their students feel connected to learning. Developmentally responsive practices used by the school include:

- All students have an adult advocate.
- A strong teaming structure provides opportunities for teachers to connect with students daily.
- Students actively participate in parent-teacher conferences.
- Students are offered an array of electives (art, band, music theory, music appreciation, computers, computer graphics, publications, and Advancement Via Individual Determination [AVID]).
- Parents are partners in the school's educational process.
- After-school activities such as seasonal sports are offered for both boys and girls.
- A variety of clubs are available after school.

- [Frank Wright DataQuest School Profile](#)
- [Frank Wright Middle School](#) (Outside Source)

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