Relevance Strategic Designs
High Tech High School

ERS
Education Resource Strategies

Rethinking Resources for Student Success

Case Studies of Leading Edge Small Urban High Schools

Education Resource Strategies

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Case Studies of Leading Edge Small Urban High Schools

This report is one of nine detailed case studies of small urban high schools. Each case study can be accessed individually or in one complete document at www.educationresource strategies.org.

Core Academic Strategic Designs

1. Academy of the Pacific Rim
2. Noble Street Charter High School
3. University Park Campus School

Relevance Strategic Designs

4. Boston Arts Academy
5. Life Academy of Health and Bioscience
6. Perspectives Charter School
7. TechBoston Academy
8. High Tech High School

Personalization Strategic Designs

9. MetWest High School

Also available on our Web site, www.educationresourcestrategies.org:

- Executive summary and full report: "Strategic Designs: Lessons from Leading Edge Small Urban High Schools"
- Detailed methodology
- Data request and interview protocol
- Introduction to the "Big 3" framework
- Comparative Leading Edge School data on diagnostic resource indicators (by school)

Thirty years ago, urban high school organization looked similar from one school to the next. Today, rising dropout rates and persistent achievement gaps have generated an urgency around redesigning the urban high school. Creating small high schools has become a central element of this redesign movement, with reformers envisioning improving instruction and, through the schools' "smallness," creating a supportive community of adult and student learners.

At Education Resource Strategies (ERS), in our work with school and district leaders, we have found that many school districts begin creating small high schools without a clear sense of how much they will spend or how to ensure that small schools organize in ways that will promote high performance. In response, the Bill & Melinda Gates Foundation supported ERS in a three-year effort aimed at building understanding and tools to support districts in creating cost-effective systems of high-performing urban high schools.

This report is one of nine detailed case studies of small urban high schools that served as the foundation for our report "Strategic Designs: Lessons from Leading Edge Small Urban High Schools" (available at www.educationresourcestrategies.org). We dubbed these nine schools "Leading Edge Schools" because they stand apart from other high schools across the country in designing new ways to "do school" while outperforming most high schools in their local districts.

We found that Leading Edge Schools deliberately create high-performing organizational structures, or Strategic Designs, that deliberately organize people, time, and money to advance their specific instructional models — the set of decisions the schools make about how they organize and deliver instruction. They create these Strategic Designs through four interconnected practices:

1. Clearly defining an instructional model that reflects the schools' vision, learning goals, and student population.

2. Organizing people, time, and money to support this instructional model by (a) investing in teaching quality, (b) using student time strategically, and (c) creating individual attention for students.

3. Making trade-offs to invest in the most important priorities when faced with limits on the amount, type, and use of people, time, and money.

4. Adapting their strategies in response to lessons learned and changing student needs and conditions.

Reviewing the case studies, readers will find that teacher characteristics, staffing patterns, schedules, and budgets look very different across the nine schools. Their instructional models reflect three broad approaches to teaching and learning:

1. **Core academics:** a rigorous core academic college-preparatory program for all students;

2. **Relevance:** a curriculum that is relevant to student interests and/or the world in which they live; and

3. **Personalization:** personal relationships between adults and students are fostered to ensure all students are known well by at least one adult.

All Leading Edge Schools incorporate some aspects of each approach, while tending to emphasize one over the others.

We also found that although no school organizes resources exactly the same, high-performing schools organize people, time, and money to implement three high-performance resources strategies. They:

1. Invest to continuously improve **teaching quality** through hiring, professional development, job structure, and collaborative planning time.

2. Use **student time** strategically, linking it to student learning needs.

3. Create **individual attention** and personal learning environments.

Using these strategies as our framework, we assessed case study school practices and quantified their resource use. We did this by creating a set of *diagnostic indicators* that describe how schools best use their resources for improving student performance. They are used throughout the case studies to illustrate resource use.

A detailed methodology, an in-depth introduction to the "Big 3" framework, and a full list of the diagnostic indicators can be found at www.educationresourcestrategies.org.

Education Resource Strategies hopes that these case studies will serve multiple purposes: to generate ideas about implementing strategies in schools; to help develop new small schools and reform existing schools; and to engage colleagues, principals, and teachers in conversations about what is possible in their districts. By detailing how these nine Leading Edge Schools organize their resources — people, time, and money — to improve student achievement, it is our hope that readers will be able to apply the findings to their own context and contribute to changing the national conversation around resource use from "how much" to "how well."

8. High Tech High School

2861 Womble Road
San Diego, CA 92106

www.hightechhigh.org

The Gary and Jerri-Ann Jacobs High Tech High Charter School integrates academic and technical education into a rigorous, interdisciplinary curriculum to prepare students for postsecondary education.

High Tech High's mission

The Gary and Jerri-Ann Jacobs High Tech High School's mission is to develop and support innovative public schools in which all students develop the academic, workplace, and citizenship skills for postsecondary success. The school combats the twin problems of student disengagement and low academic achievement by creating personalized project-based learning environments in which all students are known well and challenged to meet high expectations.

Summarized from
www.hightechhigh.org

High Tech High, which occupies a newly designed space at the former Naval Training Center in San Diego, opened in September 2000 with 200 students in grades nine through 10. High Tech High currently enrolls approximately 500 students in grades nine through 12.[1] Students are selected randomly through a ZIP code–based lottery that aims to admit a diverse pool of students.

Launched by a coalition of San Diego business leaders and educators, High Tech High emphasizes personalized, project-based learning and taps the community to enrich the student experience and increase student engagement. All students are known well by staff and are challenged to meet high expectations. The school's goal is to show how education can be redesigned to ensure that all students graduate well prepared for college, work, and citizenship.

To reach that goal, the school operates around three principles: personalization, making connections to the surrounding adult world, and promoting a common intellectual mission. These bedrock principles shape how the school commits its resources and carries out its mission. One example of personalization at the school involves matching each student with a staff advisor who monitors the student's personal and academic development and serves as the point of contact for the family. The advisor is described as "the link between home and school, the safety net, and the student's advocate."[2]

All students participate in an "advisory group" of 15 ninth to 12th grade students who stay together with the same advisor for their High Tech High careers. The school prioritizes real-world immersion by requiring every 11th grader to complete a semester-long internship at a local business or organization. And in keeping with the school's common intellectual mission, High Tech High does not track students, rather it provides a rigorous curriculum so that students are engaged in learning and can perform at high levels.

The school uses block scheduling and organizes students' schedules to provide more time (two class periods) for core courses — such as humanities and math or science — ultimately allowing a deeper level of content instruction. The extended time for learning leads to heightened student engagement, which is particularly evident through the school's project-based learning and student internships. Student projects often involve multiple subjects and connect to some aspect of the community.

Strong teachers and rigorous curriculum

High Tech High has a rigorous college-preparatory curriculum with graduation requirements that exceed the entrance requirements to University of California schools. School leaders ensure that students receive the individual attention necessary to understand and master their coursework. The school has low teacher loads, averaging 53 students, and small class sizes, averaging 22 students.

High Tech High leaders place a premium on their staff. To ensure the best faculty, the school uses a multistep hiring process to find teachers who are experts in their subjects, are skilled in a culture that promotes project-based learning, and believe in creating a personalized learning environment for students. To widen its applicant pool, High Tech High has created a state-approved, in-house credentialing program that helps new teachers become certified in their first year of teaching. The school also provides significant professional development for its teachers, totaling 152 hours per year in addition to 150 minutes per week of collaborative planning time. During much of this collaborative time, teachers use the Collegial Coaching model to participate in peer observations and reflective conversations with colleagues. The model is designed to help teachers share effective instructional strategies as well as guide teachers in how to work together effectively.

Duplicating a successful model

High Tech High's model of educating students has been so successful that it has evolved into a school-development organization with a number of charter schools ranging from kindergarten through grade 12. As of September 2005, High Tech High had opened seven schools within California (five schools on the same campus as High Tech High), and it plans to open 10 more schools in communities across California.[3] To help spread the success and manage multiple charter schools, school organizers developed High Tech High Learning, a charter management organization (CMO) that provides comprehensive back-office and other support to each of the High Tech High schools.

High Tech High's combination of a rigorous curriculum, an emphasis on connecting students to the outside world, and a culture centered on a strong teacher-student connection prepares High Tech High students for success in college. Leadership from High Tech High's director and from the CMO keeps the school's vision intact and allows it to successfully replicate its model.

Student demographics

As shown in Figure 8.1, the demographics of High Tech High students do not mirror the San Diego Unified School District average in three key areas: race/ethnicity, English language learners, and poverty level.[4] For example, only 9 percent of High Tech High students are English language learners versus 27 percent of San Diego Unified students overall. Additionally, 22 percent of High Tech High students qualify for free and reduced-price lunch, compared to 45 percent of San Diego Unified students overall.

FIGURE 8.1

Student demographics: High Tech High and San Diego Unified district average, SY2005–06

	High Tech High	San Diego Unified district average
Race/ethnicity		
Caucasian	50%	26%
Hispanic	20%	44%
Asian	17%[i]	16%[ii]
African American	13%	14%
Unclassified/other	0%	0%
Socioeconomic status		
Free and reduced-price lunch	22%	45%
Program		
English language learners	9%	27%
Special education	9%	12%

Source: http://data1.cde.ca.gov/dataquest/; percentages are rounded to the nearest whole number.
[i] Includes 8.3 percent Filipino students.
[ii] Includes 6.9 percent Filipino students.

To increase the number of under-represented and high-poverty students, High Tech High focuses heavily on outreach efforts to families living in poor neighborhoods throughout San Diego. However, because of California's Proposition 209, High Tech High cannot use student demographics to influence its admissions process. Instead, it has instituted a ZIP code–based lottery that serves as a proxy for ensuring a diverse student population. All interested students complete an application and attend an informational session about the school.

Students not granted admission through the lottery are placed on a waiting list and are accepted if space becomes available. High Tech High leaders say the school has yet to meet its target number of students qualifying for free and reduced-price lunch, as it has fewer of
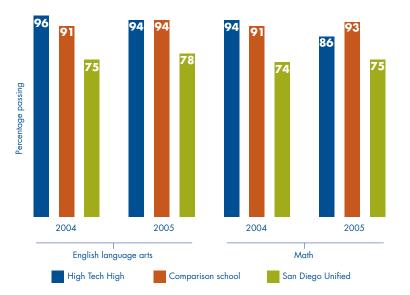
these students than the district average. One contributing factor is that transportation is not available to the school, which makes it difficult for many low-income students who do not live near the school.

Student performance

Students who do attend High Tech High are excelling and outperforming San Diego Unified schools in many academic areas. Figure 8.2 shows performance data for 10th grade students on the 2004 and 2005 California High School Exit Exam (CAHSEE) compared to the highest-performing nonexam comprehensive high school in the district and the district average.[5] High Tech High students outperform the district across all categories, and they are comparable to students in the highest-performing nonexam school in the district.

FIGURE 8.2

Percentage of students passing CAHSEE: High Tech High, comparison school, and San Diego Unified, 2004 and 2005

Source: http://data1.cde.ca.gov/dataquest/.

Note: CAHSEE is only reported as percentage passing and does not yet break student scores down by proficiency.

High Tech High also exceeds the San Diego Unified average in other performance areas, such as attendance and graduation rate, and it has a lower dropout rate, as shown in Figure 8.3.

FIGURE 8.3

Other indicators of student performance, SY2004–05

	High Tech High	San Diego Unified district average
Attendance	97%	74%
Dropout rate (4 year, 9–12)	0%	12%
Graduation rate[i]	99%	82%

Source: http://data1.cde.ca.gov.

[i.] As reported and calculated by National Center for Education Statistics definition.

Per-pupil spending

High Tech High receives a lump sum of $5,470 per pupil from the state, and it also relies on private grants to subsidize the costs of start-up and replication. The school's chief operating officer (COO) noted that High Tech High needed additional funds during its start-up phase, when there were fewer students and high fixed capital expenditures. High Tech High Foundation, a separate nonprofit, helps High Tech High schools secure private grants. The foundation also runs an ongoing capital campaign to support the acquisition and remodeling of High Tech High facilities. In SY2005–06, High Tech High raised $120,000 in private funding.

High Tech High Learning, High Tech High's CMO, was created to support the back-office functions of all the schools and the replication process. The CMO has a staff of 27, including a CEO, COO, a director of special education, and a support staff for instructional technology, facilities, business, development, site support, communications, and outreach functions. Each school pays High Tech High Learning an 8 percent management fee for the business services it provides. In addition, the CMO is subsidized by private sources, which allows the management fee not to exceed the industry standard of 8 percent for CMOs. For High Tech High, this 8 percent management fee totaled $241,000 in SY2005–06.

Despite the school's commitment to serve special education students, High Tech High struggled for years to secure the autonomy and funding needed to offer special education programs. To obtain the control over special education funding, High Tech High applied to become a local education agency (LEA). LEA status offers High Tech High schools a degree of autonomy and accountability comparable to that afforded to California school districts.

High Tech High organizes its special education funding through California Department of Education dollars that are then filtered into a Special Education Local Education Plan Area (SELPA). As an LEA, High Tech High can draw down dollars on a fee-for-service schedule based on the needs of each special education student. If the school incurs costs above the amount available to them through SELPA, they pay the difference, and if they spend less, the school is able to roll over the dollars in a restricted special education fund.

LEA status has profoundly affected the services High Tech High now provides its special education students. Says the special education director, "Not only do we now have access to an equitable share of special education funding, but we have the autonomy to deliver services in a manner consistent with [the Individuals with Disabilities Education Act] and the High Tech High design principles."

The per-pupil expenditures shown in Figure 8.4 reflect the High Tech High SY2005–06 costs, including 8 percent of the CMO costs, as described above. High Tech High invests 57 percent of its budget on instruction and keeps student-teacher ratios low (17:1), which aligns with the school's vision of a rigorous academic program in a personalized learning environment.

FIGURE 8.4

Per-pupil operating expenditures, SY2005–06

	High Tech High	San Diego Unified comparison school[i]
Total fully allocated operating budget[ii]	$3,222,408	$9,635,167
General education per pupil (unweighted, fully allocated, including private, no geographic adjuster)	$5,470	$5,110
Percentage above that is privately funded	0%	N/A[iii]
Percentage spent on instruction Student-teacher ratio	57% 17:1	49% 30:1
Percentage spent on leadership[iv]	13%	8%
Percentage spent on pupil services[v]	5%	3%

[i.] Comparison schools are the highest-performing, nonexam schools in the district that were selected to provide a comparison to the Leading Edge Schools' per-pupil cost.[6]

[ii.] Fully allocated operating budget includes the costs of running a school on a daily basis.[7]

[iii.] Data on private funding were not collected for the comparison schools.

[iv.] Leadership coding includes all functions associated with governance, school administration, secretaries and clerks supporting school leaders, and accountability (research, evaluation and assessment, community relations, attendance tracking, student assignment, etc.).

[v.] Pupil services coding includes all functions associated with noninstructional programs.[8]

Flexibility dimensions[9]

As a charter school, High Tech High has autonomy to hire and fire its staff, determine staff salary, and decide on class size and the length of the student and teacher day and year (see Figure 8.5). However, the school must comply with No Child Left Behind (NCLB) certification requirements for teachers. Despite its flexibility in salary allocation, High Tech High salaries closely resemble the salary schedule of San Diego Unified, with a slight increase.

Additionally, High Tech High must comply with special education staffing requirements. However, the funding flexibility for special education described previously now allows High Tech High to hire its own special education staff that understands the school's academic approach, design principles, and importance of a full-inclusion model. The focus of the special education program is to provide students with services in regular education classes rather than segregating them without a strong, clear connection to the core curriculum.

"We don't want to modify the course integrity to the point that we are compromising the richness of the curriculum," the special education director says. The funding flexibility High Tech High has achieved through SELPA allows it to achieve this goal. The special education staff at High Tech High consists of two full-time special education teachers, two full-time education assistants, numerous subject specific tutors, the director of special education, and a part-time administrative assistant.

FIGURE 8.5

Flexibility dimensions

Flexibility dimension	High Tech High
Hiring and firing	Yes
Teacher time	Yes
Class size	Yes
Student time	Yes
Staffing composition	Yes
Salary	Yes
Option to opt out of district services	N/A
Discretion over nonsalary budget	Yes

Resource strategies

The following sections highlight High Tech High's practices around three resource strategies of high-performing high schools: the school's investment in teaching quality, its strategic use of student time, and the provision of individual attention to students.[10]

High Tech High resource strategy highlights

1. *Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time*

   - Rigorous hiring process with annual performance contracts to ensure that teachers are high quality and the right fit with the school's instructional model

   - Significant professional development and collaborative time embedded in teachers' schedules, totaling 242 hours per year

   - Use of internal expertise to build capacity through a peer coaching model and study groups

2. *Use student time strategically, linking it to student learning needs*

   - College-preparatory curriculum that has nearly 400 hours per year more in core academic courses than the local district average

   - Student learning connected to the real world through project-based learning and 11th grade internships

3. *Create individual attention and personal learning environments*

   - Personalization fostered through low teacher loads and small class sizes

   - Strong school culture and relationships developed and supported through the advisory program

   - Comprehensive system to track student learning and progress through portfolios, exhibitions, and presentations of learning

■ **Resource strategy 1**

Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time

- *Rigorous hiring process with annual performance contracts to ensure that teachers are high quality and the right fit with the school's instructional model*
- *Significant professional development and collaborative time embedded in teachers' schedules, totaling 242 hours per year*
- *Use of internal expertise to build capacity through a peer coaching model and study groups*

Rigorous hiring process with annual performance contracts to ensure that teachers are high quality and the right fit with the school's instructional model

Rigorous hiring process

High Tech High's model of team teaching and internal professional development places a high priority on hiring the right people who have content expertise and thrive in a collaborative culture. High Tech High's director describes ideal teachers as being "experts in their content areas who can engage students to be active learners." After first screening résumés, the entire High Tech High campus (consisting of five schools) hosts a "hiring bonanza" each spring.[11] During this time, approximately 20 candidates per day come to observe classes, teach a lesson, and be interviewed by teachers and students. Directors of the campus schools get feedback from the teachers and student groups and make final decisions based on school needs.

Internal teacher credentialing

High Tech High uses the interdisciplinary model in which English and social studies are taught in a humanities block and math and science are taught in a math-science block. High Tech High teachers typically hold a credential in one of the two subjects they teach (English language arts and social studies, or math and science); but under NCLB, teachers now need to be certified in both content areas to meet the highly qualified status. To avoid having this requirement limit its ability to hire the most qualified applicants, High Tech High recently developed its own teacher credentialing program, the first charter school in California to do so. The school can hire the best teachers, regardless of certification status, and still meet the highly qualified requirement by supporting the teachers through the credentialing process in their first year of teaching.

Compensation and annual performance contracts

High Tech High rewards and retains only the most effective teachers through its compensation and evaluation systems. High Tech High teachers are paid based on experience, degree, and certification, similar to district practice. High Tech High also goes further, giving small pay adjustments to teachers who assume additional leadership roles, such as mentoring new teachers in the credentialing program. The school director conducts annual performance evaluations with teachers when their contracts are reviewed. Teachers rated "unacceptable" or "marginal" may be placed on a performance development program and must demonstrate sufficient progress by the end of an allotted time. There is typically one teacher per year who leaves because the fit is not good for either the individual or the school.

Significant professional development and collaborative time embedded in teachers' schedules, totaling 242 hours per year

High Tech High teachers have a substantial amount of professional development each year. Teachers have eight days of professional development before the school year starts, four days spread throughout the year, and two days at the end of the year. Teachers use this time to become familiar with the school's Collegial Coaching model, look at student work, and develop curriculum and learning standards for students. New teachers have an additional two days before the start of school to become familiar with school norms and practices. Approximately 50 percent of High Tech High's new teachers participate in the school's credentialing program in which they meet for an additional three to five hours a week throughout the year and are assigned to a mentor teacher on the campus. The school director notes, "This is a place where we're talking about our practice all the time … not just for new teachers; it's for everybody."

In addition to the 14 full days devoted to professional development, High Tech High teachers also have the first hour of their day, four days a week, dedicated to professional development or collaborative planning time. "Previous experience made me a firm believer that ongoing [professional development] the first thing in the morning is the best opportunity to get work accomplished," says the school's CEO. One and a half meetings per week are focused on full staff professional development in which teachers discuss Collegial Coaching, interdisciplinary coordination, and study group topics. The other two mornings are devoted to collaborative planning time, including discussion of curriculum standards and alignment, standards of student work, and various other things.

In all, 15 percent, or 242 hours, of teacher time annually is spent in professional development and collaborative planning time. This equates to 219 more hours in professional development and collaborative planning time than a teacher at a typical urban high school.[12] High Tech High's investment of teacher time in professional development and collaborative planning time represents approximately 5 percent of the school's fully allocated budget, or $5,814 per teacher.

Use of internal expertise to build capacity through a peer coaching model and study groups

Peer coaching model

High Tech High uses the Collegial Coaching model to build internal capacity of its teachers. The Collegial Coaching model is based on the notion that a staff's education, training, and background are the school's strongest resources. The professional development strategy consists of peer observations, reflective conversations, and coaching sessions.

On the first professional development day before the school year begins, teachers are paired and learn how to make objective observations of teaching practice, engage in a reflective conversation about practice, and create a safe rapport that encourages teachers to practice new techniques. A structured format provides examples of objective questions to ask after an observation and ways to offer constructive critiques to build collaboration. During nonprofessional development days, the teacher pairs must complete a "coaching cycle," visiting each other's classroom for observations and reflections.

Study groups

All High Tech High teachers participate in "study groups," which are shared governance committees that help run the school. Each study group consists of three to four teachers, one of whom serves as the leader. The groups are formed around areas of need — such as budget, scheduling, professional development, and advisory — but are created based on teachers' interests, so their assistance is best suited to those areas. For example, the study group leader for professional development works closely with the director to design agendas for the morning meetings.

In addition to helping the school, study groups also are a way to engage all High Tech High teachers in school governance by sharing leadership roles that in a larger school may be typically filled by administrators. The groups meet twice a month during the teachers' morning meeting in addition to other informal meetings.

Resource strategy 2

Use student time strategically, linking it to student learning needs

- *College-preparatory curriculum that has nearly 400 hours per year more in core academic courses than the local district average*
- *Student learning connected to the real world through project-based learning and 11th grade internships*

College-preparatory curriculum that has nearly 400 hours per year more in core academic courses than the local district average

High Tech High has a college-preparatory curriculum with graduation requirements (see Appendix 8.3) that exceed the University of California entrance requirements. Adhering to the school's design principle of a common intellectual mission, all students follow the same core academic strand, as shown in Figure 8.6. All subjects focus on a standards-based curriculum that supports achievement of the academic standards and the expected schoolwide learning goals. There is no ability grouping with the exception of foreign language classes and honors options in the upper grades.

FIGURE 8.6

High Tech High course sequence

Grade	Course sequence
9th	Humanities (English and Ancient World History), Integrated Math-Physics, Spanish, Graphic Arts (one quarter), Inventions (Business) (one quarter)
10th	Humanities (English and Modern World History), Integrated Math-Chemistry, Spanish, Graphic Arts (one quarter), Robotics/Inventions/Other (depends on the team) (one quarter)
11th	Humanities (English and U.S. History), Biology, Math, one semester-long required internship, one semester of Principles of Engineering when not on internship, one elective
12th	English, Physics, Math, Senior Concentration, Senior Project, other courses to fill graduation requirements and fill schedule

High Tech High was reluctant to offer AP courses, as they are structured to cover large amounts of content and do not align with High Tech High's instructional vision of project-based learning. However, in response to student interest, High Tech High offers a few AP classes that students can take as electives.

High Tech High students take four years of English, four years of math, four years of laboratory science, three years of history, two years of foreign language, one year of visual and performing arts, and one year of a college-preparatory elective. In addition to the University

of California entrance requirements, High Tech High students must take one semester of an engineering class and one semester of an academic internship in the 11th grade, and they must complete a senior project.

Much of this class time is possible because of the extra learning time at High Tech High. Compared with San Diego Unified students, High Tech High students are in school for an additional 55 minutes a day, which accumulates to an additional 159 hours each year.[13] High Tech High students spend 771 hours, or 61 percent, of their yearly time in core academic subjects. When looking solely at hours in core academic classes, High Tech High students have nearly 400 additional hours in core academic classes each year than their peers attending district schools. This suggests that not only is High Tech High increasing overall student time, but it is focusing a greater portion of its time on core academic classes.

Student learning connected to the real world through project-based learning and 11th grade internships

High Tech High lives up to its principle of connecting students to the real world through its curriculum, internship program, and student projects. As shown in Appendix 8.2, the student day at High Tech High is from 8:40 a.m. to 3:40 p.m. (420 minutes), organized in a five-period block schedule with longer instructional blocks on Mondays and Fridays. The schedule helps prioritize the project-based learning curriculum and interdisciplinary focus that is at the core of the High Tech High model. Students take interdisciplinary humanities and math-science classes, which are each taught across two period blocks, while electives have a one-period allotment of time. The longer blocks provide time for teachers and students to explore the content more thoroughly and connect student learning to real-world experiences.

Every High Tech High student must complete at least one semester-long internship during 11th grade. The philosophy behind the internship is based on research that shows (1) internships will inspire students to go college, (2) the exchange of ideas between students and adults and the relationships with a workplace mentor are really important, and (3) the real-world project work is very rich and helps students find relevance in their work at school.

Students begin preparation for the internship program in ninth grade by creating a digital portfolio that includes their résumés and future deliverables for the internship program. In 10th grade, students visit workplaces in the San Diego area, prepare and refine their résumés, and work with teachers on interviewing skills.

The 11th grade schedule accommodates internship time twice a week for a half day, with a minimum of eight to 10 hours per week. Depending on their interests, students participate in internships at businesses, schools, nonprofit organizations, and professional associations in San Diego. Internships have included positions at Qualcomm Communications, government offices, arts-based organizations, medical facilities, and media outlets. Students are supported throughout the process by their employers, teachers, advisors, and the internship coordinator.

These internships leverage an enormous amount of external expertise for High Tech High students. They connect students to the world outside school, by both providing them with professional skills and creating a relationship with a mentor who can be a future advocate or contact for the student. This external expertise comes at no cost to the school, beyond the salary of the internship coordinator, who establishes and manages the relationships.

In addition to the two half days students are at their internship site, one period per week is spent working with a High Tech High teacher on the internship projects. These projects include journal entries on the challenges and successes students experience at the internship, an interview with the student's mentor, and a presentation about the organization and work the student completed at the internship. Students also are required to present their work at the conclusion of the internship.

During the senior year, students complete two semester-long or one yearlong senior project. Some examples of High Tech High student projects include an integrated urban ecology study of San Diego Bay, the physics of art, and a multimedia film project.[14] The project is a culminating experience that allows students to use the skills they have learned in the classroom and through the internship experience to explore a topic about which they are passionate.

■ Resource strategy 3
Create individual attention and personal learning environments

- *Personalization fostered through low teacher loads and small class sizes*
- *Strong school culture and relationships developed and supported through the advisory program*
- *Comprehensive system to track student learning and progress through portfolios, exhibitions, and presentations of learning*

Personalization fostered through low teacher loads and small class sizes

The average teacher load for a core academic teacher at High Tech High is 53 students, compared to a typical teacher load in most urban high schools of approximately 125 students.[15] This smaller load allows High Tech High teachers to get to know their students well and have the time to provide them with more individual attention. High Tech High creates a low teacher load through its blocked class schedule and teaching teams in which two to three teachers work together with a group of students for the majority of the day.

In the ninth and 10th grades, 40 to 50 students are assigned to teaching teams of one humanities teacher and one math or science teacher. Because the content of the math and science curriculum becomes more specialized in the upper grades, in the 11th and 12th grades the teacher teams consist of a humanities teacher, math teacher, and science teacher who

work with a group of 50 to 70 students. With double blocks of core academic classes, teachers only instruct two or three groups of students each day, as opposed to five or six groups of students in a traditional high school.

A small class size of 22 students in core academic subjects also increases the opportunity for students to receive individual attention. With a heterogeneous group of skill levels, High Tech High's small class sizes and low teacher loads ensure that students' learning needs are known and supported.

These personalization strategies are necessary, as High Tech High does not have a separate time during the school day for students to receive one-on-one or small group support. The school often uses the elective "X block" for special education students to receive additional support. When necessary, a regular education student struggling in a core academic area also can use X block to receive tutoring, although this is less common.

Strong school culture and relationships developed and supported through the advisory program

High Tech High also creates a personalized learning environment for students through its advisory program. "Advisory is about the connection between the schools, students, and family," says the school's director. "It ensures all students are known well by an adult." Every faculty member, including the director, has an advisory group of 15 students. The advisory groups are mixed with students in grades nine through 12, and they stay together throughout their High Tech High careers.

The purpose of the advisory program is to help students make the most of their experiences as members of the High Tech High community so that they can be well prepared for and successful in postsecondary education. Advisory encompasses social support, academic support, and planning for the future. The theme for advisory in SY2005–06 is "Community, Culture, College, and Career." There is not a set curriculum, but the advisory committee provides teachers with ideas for activities and ways to run the groups.

Through weekly advisory group meetings and individual conferences, the advisor facilitates academic planning, home-school communication, team and community building, and reflection on the High Tech High philosophy and program. Students develop a plan as a basis for course selection and exploration of future options that the advisor monitors throughout the four years. It also is expected that advisors will visit all students and their families at home during the students' first year at High Tech High. This home visit provides a communication line between parents and the school, with the advisor serving as the students' advocate and safety net.

Comprehensive system to track student learning and progress through portfolios, exhibitions, and presentations of learning

To best assess how its students are progressing, High Tech High uses student portfolios, exhibitions, and presentations of learning, in addition to state-mandated standardized exams, such as CAHSEE. School leaders believe these additional benchmarks provide a more comprehensive picture for teachers and students of the students' strengths and weaknesses.

Students create a personal digital portfolio in the ninth grade and update it as they progress through each grade. The portfolios include students' personal statements, projects and research papers from core academic courses, résumés, and reflections on their 11th grade internship experience. High Tech High has a two-to-one student-to-computer ratio that allows students access to create, modify, and update their digital portfolios.

High Tech High also checks in on student learning by transforming the typical parent-teacher conference into a week of student-led conferences in March. This unique structure puts the students at the center and makes them responsible for presenting what they have learned and accomplished. Students must convey their study habits, strengths, weaknesses, and goals to their parents and teachers.

Finally, throughout their tenure at High Tech High, students are required to complete annual midyear presentations of learning in December and end-of-year transition presentations of learning in June. A presentation of learning is a formal presentation by a student to a panel of his or her peers, community members, administration, teachers, and parents that demonstrates the student's thoughtful reflection on High Tech High's learning goals. The transition presentation of learning is 15 to 25 minutes and is used to determine whether the student has made sufficient progress to move to the next grade level. "Making student work visible and coming to conclusions as a community about what good work looks like is a powerful process," says the school's director.

Resource strategies

Resource principles	What we see in the school	Diagnostic indicators
Invest in teaching quality		
Hire and organize staff to fit school needs in terms of expertise, philosophy, and schedule	• Hiring bonanza: Candidates observe classes, teach a sample lesson • Multiple in-person interviews with High Tech High leadership, teachers, and students	• Use of a rigorous, strategic hiring process • 87% of core teachers teaching more than one subject • Leverage outside experts for noncore courses
Integrate significant resources for well-designed professional development that provides expert support to implement the schools' instructional models	• 14 full days devoted to professional development spread before, during, and after school year • Weekly professional development time: 60 minutes before school one day per week, 30 minutes before school one day per week • Focus of professional development: looking at student work, interdisciplinary coordination, and alignment	• $298 per teacher on professional development (not including teacher time) • 2% staff with instructional leadership roles
Design teacher teams and schedules to include blocks of collaborative planning time effectively used to improve classroom practice	• Weekly collaborative planning time: 60 minutes before school two days a week, 30 minutes before school one day a week	• 15% of teacher year in professional development (with collaborative planning time) • 242 total yearly teacher professional development hours (with collaborative planning time) • 150 minutes collaborative planning time per week • 7% professional development in content-based teams
Enact systems that promote individual teacher growth through induction, leadership opportunities, professional development planning, evaluation, and compensation	• Collegial Coaching model and teacher study groups • Annual performance contract for teachers • High Tech High teacher credentialing program for new teachers	• Ratio of teachers to school-based evaluators is 30:1 • Regular review of teacher performance and growth • 0% of teacher compensation devoted to leadership roles

(continued)

Resource principles	What we see in the school	Diagnostic indicators
Use student time strategically		
Purposefully align the schools' schedules with their instructional models and student needs	• When necessary X block (noncore academic block) is used for additional support for special education students and struggling regular students • Integrated disciplinary theme	• School schedules reflect instructional model and academic needs of students • 240 total yearly hours in noncore academics • 19% of student year in noncore academics
Maximize time on academic subjects, including longer blocks of uninterrupted time	• School creates block scheduling to facilitate interdisciplinary learning • 11th and 12th grade internships connect learning to outside world	• 1,260 yearly student hours • 771 average yearly hours in core academics • 885 yearly hours in ninth grade core academics • 621 yearly hours in 12th grade core academics • 61% of student year in core academics • 3,084 total core academic hours over four years
Vary individual student time when necessary to ensure all students meet rigorous standards	• Humanities and math-science blocks scheduled for two periods per day • Graduation requirements exceed University of California entrance requirements	• 0 yearly hours spent in academic support • Ratio of time in ninth grade math to average time in math: 1.0 • Ratio of time in ninth grade English language arts to average time in English language arts: 1.1
Create individual attention		
Assess student learning on an ongoing basis and adjust instruction and support accordingly	• Comprehensive system for tracking student progress through students' digital portfolios and bi-annual demonstrations of students' work	• Use formative assessments systematically to guide instruction throughout the year
Create smaller group sizes and reduced teacher loads for targeted purposes	• Full-inclusion model • Small class sizes and teacher loads • Team teaching model	• Average class size overall: 21 • Average class size core: 22 • Average class size English language arts: 23 • Average class size math: 22 • Average teacher load overall: 53 • Average teacher load core: 53 • Average teacher load English language arts: 51 • Average teacher load math: 55
Organize structures that foster personal relationships between students and teachers	• Advisory groups of ninth through 12th grades that stay together for four years • Expectation for advisor to partner with families and guide student through high school and prepare students for college	• 15 students assigned to adult advocate advisor • Student to core academic teacher ratio is 19:1 • 24 yearly teacher hours spent in social and emotional support • 507 students in grades 9–12 • Looping practices around strategically grouped students through core academics and advisory

High Tech High sample student schedule

	Monday	Friday		Tuesday	Wednesday	Thursday
8:40–9:55	Humanities	Humanities	8:40–9:45	Language	School Meeting	Language
10:00–11:15	Humanities	Humanities	9:50–10:55	Math/Science	Math/Science	Math/Science
11:20–12:35	Elective	Elective	11:00–12:05	Math/Science	Math/Science	Math/Science
12:35–1:20	Lunch	Lunch	12:10–12:50	X Block Elective	Advisory	X Block Elective
			12:50–1:35	Lunch	Lunch	Lunch
1:20–2:30	Math/Science	Math/Science	1:35–2:35	Humanities	Humanities	Humanities
2:35–3:40	Math/Science	Math/Science	2:40–3:40	Humanities	Humanities	Humanities

APPENDIX 8.3

High Tech High graduation requirements

Subject	Number of years
English	4
Math	4
Science	4
History	3
World language	2
Visual and performing arts	1
College-preparatory elective	1
Engineering	.5
Internship	.5
Senior project	1

High Tech High staff list

Position	Full-time equivalent	ERS coding categories	Other
Spanish teacher	1.0	Instruction	
Humanities teacher (9th)	1.0	Instruction	
Math/science teacher (10th)	1.0	Instruction	
Special education	1.0	Instruction	
Dean of Students	1.0	Leadership	
Math/science teacher (11th)	1.0	Instruction	
Math/science teacher (9th)	1.0	Instruction	
Director	1.0	Leadership	
Janitorial	0.5	Operations and maintenance	
Administrative assistant	1.0	Leadership	
Humanities teacher (11th)	1.0	Instruction	
Math/science teacher (11th)	1.0	Instruction	
Math/science teacher (12th)	1.0	Instruction	
Special education	1.0	Instruction	
Multimedia teacher	1.0	Instruction	
Humanities teacher	1.0	Instruction	
Math/science teacher	1.0	Instruction	
Math/science teacher (10th)	1.0	Instruction	
Humanities teacher (9th)	1.0	Instruction	
Graphic design teacher	1.0	Instruction	
Math/science teacher (10th)	1.0	Instruction	
Wireless lab teacher	1.0	Instruction	
Math/science teacher (9th)	1.0	Instruction	
Humanities teacher (9th)	1.0	Instruction	
Humanities teacher (12th)	1.0	Instruction	
Humanities teacher (10th)	1.0	Instruction	
Internship coordinator	1.0	Leadership	
Special education tutor	1.0	Pupil services	
Humanities teacher (10th)	1.0	Instruction	
Math/science teacher (9th)	1.0	Instruction	
Business teacher	0.5	Instruction	
Biotechnology teacher	1.0	Instruction	
Math/science teacher (11th)	1.0	Instruction	
Humanities teacher (11th)	1.0	Instruction	
College advisor	1.0	Pupil services	

(continued)

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Position	Full-time equivalent	ERS coding categories	Other
Spanish teacher	0.5	Instruction	
Humanities teacher (10th)	1.0	Instruction	
Development coordinator	0.08	Leadership	CMO position
Texas teacher	0.08	Instructional support and professional development	CMO position
Staff accountant	0.08	Business services	CMO position
Academic coordinator	0.08	Instructional support and professional development	CMO position
Manager of assessment and accountability	0.08	Business services	CMO position
Student instructional support coordinator	0.08	Business services	CMO position
Business manager	0.08	Business services	CMO position
Chief financial officer	0.08	Business services	CMO position
Director of facilities	0.08	Operations and maintenance	CMO position
Director of information technology	0.08	Business services	CMO position
Director of communications and outreach	0.08	Leadership	CMO position
Legal counsel	0.08	Business services	CMO position
Information technology administrator	0.08	Business services	CMO position
Director of site support	0.08	Leadership	CMO position
Director of Texas school	0.08	Leadership	CMO position
Executive assistant to chief executive officer	0.08	Leadership	CMO position
Texas teacher	0.08	Instructional support and professional development	CMO position
Director of special education	0.08	Instructional support and professional development	CMO position
Director of High Tech High Learning	0.08	Instructional support and professional development	CMO position
Chief executive officer	0.08	Leadership	CMO position
Special projects manager	0.08	Leadership	CMO position
Staff accountant	0.08	Business services	CMO position
Design director	0.08	Business services	CMO position
Regional director	0.08	Leadership	CMO position
Director Texas school	0.08	Leadership	CMO position
Chief operating officer	0.08	Business services	CMO position
Project coordinator	0.08	Leadership	CMO position

CMO = Charter management organization

Education Resource Strategies, Inc., is a nonprofit organization that has worked extensively with urban public school systems to rethink the use of district- and school-level resources and build strategies for improved instruction and performance.

Our mission is to be a catalyst for the creation of high-performing urban school systems by promoting and supporting the strategic management of education resources. Our unique strength is in our action research where our partnerships with school systems bridge research and practice. We support our clients with Web-based tools, research and training, and diagnostic analyses tailored to their districts. Together, we outline strategies that are actionable and transformational both within and beyond the districts in which we work.

ERS's work and research have identified several areas in which school systems effectively leverage their resources to improve instruction, forming the basis for our five practices areas: Strategic School System Design; School Funding and Staffing Systems; Strategic School Design; School Support, Planning, and Supervision; and Human Capital.

For more information on Education Resource Strategies and our work and practice areas, visit www.educationresourcestrategies.org.

Rethinking the Cost of Small High Schools Project

The Bill & Melinda Gates Foundation supported Education Resource Strategies in a three-year effort aimed at building understanding and tools that would support districts in creating cost-effective systems of high-performing urban high schools.

Out of our extensive research, we created the following reports and tools to support leaders as they consider and design small high schools in their districts. All materials are available at www.educationresourcestrategies.org.

- **"The Cost of Small High Schools: A Literature Review"**

- **"Strategic Designs: Lessons from Leading Edge Small Urban High Schools"**

- **"Case Studies of Leading Edge Small Urban High Schools"**

- **"District Spending in Small and Large High Schools: Lessons from Boston, Baltimore, and Chicago"**

- **Going to Scale Tool**

- **Small Secondary School Design Tool**

- **District Assessment Tool**