



Pittsburgh

Science & Technology

Abstract and Executive Summary

November 11, 2007

Pittsburgh Public Schools

ABSTRACT

Pittsburgh Public Schools is committed to opening an innovative secondary school that is academically focused in competitive fields of science and technology. Pittsburgh Science and Technology will challenge the traditional role and structure of the high school in order to connect *all* students to a relevant postsecondary opportunity.

The school will accept a diverse group of motivated students with specific interest in science and technology fields. Some of these students are expected to enter the school academically prepared for advanced coursework. Others will enter the school performing below grade level. A carefully designed set of systems allows the school to meet the academic needs of all students, regardless of their initial academic level.

Important elements of PST include:

- **Four required types of advanced coursework** which are (1) Discipline Specific, (2) Interdisciplinary, (3) Applied, and (4) Postsecondary Preparation;
- **A five-level structure** which replaces the traditional 6-12 system, allowing students to advance at an appropriate pace and achieve promotion by demonstrating academic readiness;
- **A middle grades cohort** which supports the establishment of sustained positive relationships, reduces disruptive transitions, and facilitates 6-12 curricular alignment;
- **Four academic concentrations** that bring together science, technology, and other disciplines in a sequence of thematic courses that integrate the “practical” and the purely scientific;
- **A professional approach to teaching** characterized by increased planning time, an eight-hour workday, and a rotating Professional Education Program.
- **Yearlong, semester length, and quarter length courses** increasing scheduling adaptability;
- **A research based curriculum** that emphasizes curiosity and the application of knowledge to authentic challenges in addition to the traditional focus on teaching facts and skills;
- **An advisory and postsecondary preparation sequence** that includes the development of a personalized program in cooperation with a faculty advisor;
- **Ten additional school days and 80-minute course periods** which support in-depth inquiry and provide time for intervention, enrichment, and professional development;
- **Project-based, inquiry driven courses** aligned with the stages of effective learning; and
- **Curricular alignment** with the expectations of universities and 21st century employers.

The Executive Summary and accompanying report describe these features, and others, that will make up Pittsburgh Science and Technology. Also included in the full report are descriptions of the challenges that these systems are designed to overcome, references to the research and to the existing schools that inspired elements of the design, and justification for its innovations. Finally, the report identifies areas that require further development.

A secondary school that strategically challenges the role and structure of traditional comprehensive high schools is an exciting step for the city of Pittsburgh. PST students obtain an education that is relevant, career-oriented, and flexible enough to adapt to their academic and developmental needs. The city of Pittsburgh benefits from a school that enhances regional economic competitiveness, and meets the demand for science and technology training.

EXECUTIVE SUMMARY

Introduction

Responding to a National Challenge

Only about 70 percent of American 9th graders are making it to graduation four years later.¹ For African American and Hispanic students graduation rates are lower, 53.4 and 57.8 percent respectively.² Equally problematic is the fact that many students who do graduate from high school lack the skills necessary for success in higher education or for connection to a sustainable economic opportunity. In 2002, only 34 percent of graduates were considered to be adequately prepared for college.³ “Higher education institutions, businesses, and students and families themselves are spending upward of \$17 billion each year on remedial classes just so students can gain the knowledge and skills that they should have acquired in high school.”⁴

Polls indicate a steady erosion of satisfaction with public education since 1969.⁵ Yet, while the decline in public confidence is indisputable, this does not mean that the performance of public schools has been getting worse. The reality is that there has never been a time when all students graduated from high school, or even when the system achieved significantly better academic results than it does today. The problem is not that our education system has gotten worse. Rather, the primary problem is that public education, particularly urban public education, has failed to keep up with a changing society and economy.

While the education system has remained static, the national economy and the needs of urban employers have been transformed. Deindustrialization, suburbanization, outsourcing, and the relocation of manufacturing jobs away from center cities changed the American economy.⁶ Historic and contemporary discrimination magnified the effects of these trends on communities of color. Education policy at all levels has been slow to adapt to this new economic situation.

Jobs which remain accessible from the urban core require higher levels of skill than they did when comprehensive urban high schools were designed. It is no longer appropriate for the school to act as a “sorting mechanism”, tracking only a select group of students toward college while leaving the majority to pursue limited low-skilled jobs that may fail to adequately support a family. As the Gates Foundation emphasizes, “Today’s large, impersonal high schools were designed for a different era and a different economy.”⁷

¹ EPE Research Center analysis in: Editorial Projects in Education [EPE]. *Diplomas count 2007: Ready for what? Preparing students for college, careers, and life after high school*. Education Week, 26(40), 2007. Retrieved from <http://www.edweek.org/ew/toc/2007/06/12/index.html>. (accessed July 31, 2007)

² Ibid. (Graduation statistics based on data from 2003-04)

³ Greene, J.P. & Winters, M.A. (2005, February). *Public High School Graduation and College Readiness Rates: 1991-2002*. New York: Manhattan Institute, Center for Civic Innovation. Retrieved from http://www.manhattan-institute.org/html/ewp_08.htm (accessed September 18, 2006).

⁴ Closing the Expectations Gap 2006: An Annual 50-State Progress Report on the Alignment of High School Policies with the Demands of College and Work (2006). Washington, D.C., Achieve, Inc.: 32.

⁵ Tyack, D. B. and L. Cuban (1995). *Tinkering toward utopia : a century of public school reform*. Cambridge, Mass., Harvard University Press.

⁶ Sugrue, T.J., *The Structures of Urban Poverty: The Reorganization of Space and Work in Three Periods of American History*. 86-117, *The Underclass Debate*, ed. Michael Katz (Princeton, NJ: Princeton University Press, 1993).

⁷ *High Schools for the New Millennium*, Bill and Melinda Gates Foundation, Retrieved from <http://www.gatesfoundation.org/UnitedStates/Education/TransformingHighSchools/default.htm> (accessed September 15, 2006).

The Challenge Facing Pittsburgh

In Pittsburgh an estimated 64 percent of students graduate from high school within five years of starting ninth grade.⁸ The rate for African-American students is 58 percent.⁹ Structural change continues to affect the Pittsburgh economy, as it does other industrial centers. In the second half of the twentieth century many residents became disconnected from the labor market when milling industries, the backbone of Pittsburgh's manufacturing economy, were mechanized, relocated to the suburbs, or moved overseas. As in other cities, the school system was unable to keep up with the changing economy and shifting social ecology. Many families continue to recognize that the school system is not adequately preparing their children for the post-industrial economy and choose to exit the system, sending their children to one of Pittsburgh's more than twenty private secondary institutions.

The 2005-2006 Pennsylvania System of School Assessment (PSSA) provides more evidence of disconnect between Pittsburgh's public schools and the 21st century economy. Only 58 percent of Pittsburgh eighth graders demonstrate proficiency in Reading, while only 46 percent demonstrate proficiency in Math.¹⁰ Adding to these upsetting percentages is the fact that they measure how well students are mastering grade-level appropriate skills as defined by Pennsylvania state standards, standards which remain low and are yet to be aligned with the expectations of the 21st century workplace.¹¹

Characteristics of Successful Urban High Schools

Researchers and education reform leaders have made significant progress in understanding the specific challenges facing urban high schools. As these challenges are articulated the characteristics that are necessary for success have become more recognizable.

Drawing from a series of MDRC (www.mdrc.org) evaluations, Janet Quint identified critical challenges associated with low-performing high schools. These challenges, slightly rephrased, serve as a starting point for understanding the keys to success for urban high schools, including Pittsburgh Science and Technology. The school must:

1. Create a personalized and orderly learning environment;
2. Assist students who enter high school with poor academic skills;
3. Improve instructional content and practice; and
4. Prepare students for the world beyond high school.¹²

⁸ Engberg, J. & Gill, B., (2006). "Estimating Graduation and Dropout Rates with Longitudinal Data: A Case Study in the Pittsburgh Public Schools." RAND Corporation, RAND Education Working Paper Series, WR-372-PPS, Retrieved July 31, 2007, from http://www.rand.org/pubs/working_papers/2006/RAND_WR372.pdf.

⁹ Ibid.

¹⁰ GreatSchools.net. (2006). "Pittsburgh School District." Retrieved November 12, 2006, from http://www.greatschools.net/cgi-bin/pa/district_profile/401/.

¹¹ Closing the Expectations Gap 2006: An Annual 50-State Progress Report on the Alignment of High School Policies with the Demands of College and Work (2006). Washington, D.C., Achieve, Inc. : 32.

¹² Quint, J. (2006). Meeting Five Critical Challenges of High School Reform: Lessons From Research on Three Reform Models. New York, NY, MDRC: 89.

Additional literature supports the significance of these fundamental challenges, while identifying five others. The school must:

1. Close the racial achievement gap;
2. Solve the social promotion/retention conundrum;
3. Provide the extra support and special attention required in ninth grade;
4. Overcome poor graduation and completion rates; and
5. Insure that students access and succeed in advanced coursework.

Pittsburgh Science and Technology (PST)

Breakthrough high schools¹³ across the United States are proving that well-designed and operated urban high schools have the ability to overcome these nine challenges. Achieving success for *all* students requires moving away from the traditional comprehensive high school and implementing an innovative, research-driven design. A school must provide flexible, individualized support systems without sacrificing the high level enrichment opportunities sought by high performing students who enter school prepared for academic success.

Pittsburgh Science and Technology is designed to succeed for groups of students entering the school at different academic levels. Students entering the school below grade level move through a “continuum of interconnected support systems,” and ultimately are connected to postsecondary opportunities. Students who enter the school at or above grade level are able to move at an accelerated pace through the same project based curriculum focused in competitive and emerging fields of science and technology. The curriculum, and each unit and lesson that make it, follow a three part progression designed first to inspire **Curiosity** and interest, second to build **Knowledge** and skills, and finally to require **Application** and generalization.¹⁴

Anonymity is eliminated at PST as students develop and follow their own academic program and maintain positive relationships with specific teachers over time. Time is used intelligently; to support quality instruction, encourage professional growth, sustain morale, and create consistency. Traditional tracking is eliminated through a combination of academic concentrations and levels that provide an alternative to the traditional age-graded structure.

The school is a necessary step for the students and families of Pittsburgh and a logical one for the city as it strives to solidify its post-industrial niche. We believe that the school will have a positive impact on the Pittsburgh community on at least three levels:

- **For its students:** First, and most directly, PST will benefit its students. They will get a 21st century education focused in one of four fields of science and technology. It will be a relevant, practical, and career-oriented education characterized by depth and inquiry. The curriculum is focused and substantive, teaching the thinking skills necessary for application and acquisition of knowledge. The school will connect students directly to higher education or to a job that is sustainable in a growth sector of the regional economy. Students will

¹³ The National Association of Secondary School Principals (NASSP) identifies high-poverty high-minority schools that are achieving exemplary results. See http://www.principals.org/s_nassp/sec.asp?CID=66&DID=66.

¹⁴ These stages of learning are based on those developed by Alfred North Whitehead in his essay titled *Rhythms of Education*.

leave with the strong combination of curiosity, interest, and thinking skills with specific tools, knowledge, and expertise in a science or technology driven field.

- **For Pittsburgh Public Schools:** While primarily focused on serving the needs of its students, Pittsburgh Science and Technology will function as a “laboratory school” for Pittsburgh Public Schools. Rather than becoming an island of high achievement in an otherwise low performing system, Pittsburgh Science and Technology seeks to examine, develop, and implement new systems and methods that might be “scaled up” and implemented throughout PPS if they demonstrate significant results. PST does not intend to serve only Pittsburgh’s elite. It is carefully designed to meet the needs of students at different academic levels.
- **For the city of Pittsburgh:** Despite the diversification of the regional economy, there is a population of Pittsburghers that remains detached from the labor market. In addition, many Americans view Pittsburgh as a 20th century city, one that has passed its prime. Thus, the city is struggling to attract immigrants and also to retain its current population. Pittsburgh Science and Technology will be an important response to both of these problems. It will be a step towards connecting city residents to the global economy and a sign to the rest of the country that Pittsburgh will remain an innovative economic leader in the 21st century.

Project Background

Mr. Mark Roosevelt, Superintendent of Pittsburgh Public Schools, has initiated *Excel. 9-12: The Plan for High School Excellence*, part of a larger Excellence for All public school reform agenda. One part of this plan is the implementation of a science and technology high school, scheduled to open in August of 2008.

Seeing the potential for a partnership between the new high school and Carnegie Mellon University, Mr. Roosevelt engaged graduate students from the H. John Heinz III School of Public Policy and Management to complete the initial design and planning phase of this science and technology high school based on research of the best practices in secondary and higher education, a secondary literature review, and data analysis. Formally, this engagement resulted in the fall 2006 Systems Synthesis Project: *Pittsburgh 2008: Science and Technology High School*. The ten members of the project team concluded their study in December of 2006 and presented their recommendations to the Board of Education in January.

Four graduate students from the original project team continued their work between January and May of 2007. The curriculum was expanded and revised as systems were integrated into a working master schedule. Simulations of student flow through PST based on PSSA and PPS data allowed the team to determine the number of courses, teachers, and students that would allow the school to operate as designed.

In July, 2007 Pittsburgh Public Schools took over the project. The newly created Office of High School Reform is currently managing implementation of the Pittsburgh Science and Technology with the goal of opening the school as planned for 2008-09.

Student Outcome Goal, Mission and Vision

Student Outcome Goal

All students will graduate having completed advanced coursework appropriate to their skills and interests. They will leave Pittsburgh Science and Technology connected to *and prepared for* a postsecondary opportunity.

School Mission

Pittsburgh Science and Technology will prepare *all* students for postsecondary success by providing a rigorous curriculum that requires four types of advanced coursework and is characterized by excellent instruction, exploration, and a commitment to achievement. All students will leave the school connected to college or to a work opportunity.

School Vision

Pittsburgh Science and Technology seeks to become a premier Pennsylvania high school, in the process redefining the role of secondary education. Regardless of the academic level that students bring to the school, all students will meet state standards in math, science, technology and English before graduation. In addition, all students will leave the school connected to their next professional or educational opportunity.

All systems operating within the school are seamlessly connected in order to achieve this bold vision. An innovative organizational structure ensures an orderly learning environment with extensive support systems. Alternative approaches to promotion allow all students to access and succeed in advanced coursework. **The curriculum is authentic and adaptive**, emphasizing depth over breadth. Four exciting academic concentrations, a uniquely flexible schedule, and individualized program goals insure that each student graduates prepared to meet and exceed the expectations of 21st century colleges, universities, and employers.

PST recognizes that **excellent teaching** by highly trained and dedicated instructors is the single most important factor in determining its success. Faculty members are provided with the time and support necessary for continuous instructional improvement and sustained job satisfaction, while also being held to high expectations for student engagement, interdisciplinary collaboration, and careful lesson planning.

Sustained community partnerships further separate PST from traditional secondary options. Teachers and students regularly collaborate with university, community, and industry partners to provide uniquely authentic and applied learning opportunities. **Active participants in their education**, each student makes continuous adjustments to their individualized long-term program according to their academic needs and changing postsecondary goals.

A commitment to equity and diversity insures that the student body is admitted fairly, that all students are equally supported, and that diversity is achieved and maintained.

Overview – About the PST Design

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| Location | Pittsburgh Public Schools staff analyzed all potential facilities, according to nine criteria: (1) physical and spatial requirements; (2) equity and access; (3) equipment and electricity; (4) environmental standards; (5) compliance; (6) school within a school vs. independent facility; (7) fit with existing and developing programs; (8) fiscal responsibility; and (9) potential for partnership creation. We recommend that the school open and grow to capacity in Oakland at the Frick building, located at 107 Thackeray Ave, 15213. |
| Student population | <p>For 2009-10 the school will accept:</p> <ul style="list-style-type: none"> • 92 ninth grade students; • 47 eighth grade students; • 47 seventh grade students; and • 47 sixth grade students. <p>One level will be added each year so that the school will graduate its first students in 2010-11, with a full size Executive Level Class in 2011-12. PST has been designed to serve between 520 and 550 students at capacity. Each year PST will accept 47 new students entering from fifth grade, and 45 new students entering from eighth grade with variation depending on number of students in the school at the time.</p> |
| Teachers, administrators, and other staff | <p>18 teachers and three administrators/counselors will teach courses at PST during its first year of operation. At capacity there will be a maximum of thirty seven teachers and six teaching administrators. This includes:</p> <ul style="list-style-type: none"> • Twelve Science and/or Technology instructors; • Nine Math instructors; • Five English instructors; • Three Spanish instructors; • Three History instructors; and • One Gym, one Art Technology, and one Music Technology instructor. <p>The Technology Coordinator, College and Career Counselor, Director of Community Relations, Deans of Students and Faculty, and the Principal complete the teaching staff.</p> |
| Courses and curriculum | <p>The curriculum is a continuum that is aligned with current education research. It is aligned with Alfred North Whitehead’s stages of learning, and is designed to overcome the challenges facing urban education. The first years of the PST experience cultivate curiosity, interest, and a love for learning. Gradually the emphasis of the curriculum shifts to precision, focusing on the acquisition of specific skills and knowledge. Finally, during the culmination of their program, students learn to generalize their knowledge and skills to new situations, experiencing a transition to application. Throughout, depth of learning is emphasized over breadth and coherent sequences over increased choice.</p> <p>At capacity, 91 courses are offered in coherent and carefully designed sequences. These courses range from yearlong interdisciplinary courses to ten week “mini” experiences focused in a specific field of science or technology.</p> <p>Students are required to complete four types of advanced coursework at the Executive Level, the equivalent of the “senior year”. These advanced courses include:</p> <ul style="list-style-type: none"> • An interdisciplinary course; • A concentration specific course; • An applied course; and • A postsecondary preparation course. <p>Though the curriculum is concentrated in science and technology fields, it is not expected that <i>all</i> graduates will work or study in science and technology after graduation. Students will acquire the thinking and learning skills necessary for success in any area of interest.</p> |

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| Schedule | An extended day, extended school year, and unique five-period day support in-depth inquiry and provide time for intervention and enrichment. As at the Accelerated Learning Academies, the school year is extended by 10 days for students. Each day is extended to 7 hours 21 minutes, with an eight hour paid workday for teachers. Four eighty-minute academic periods surround a 99-minute activity period that includes two lunch shifts. |
| SciTech Concentrations | Students enter one of four Science and Technology concentrations after completing the equivalent of the ninth grade. The concentrations consist of an exciting sequence of courses that are new to Pittsburgh Public Schools. The course sequence is designed to balance exposure to several different professional fields within each concentration with deep project based experiences and high level scientific analysis. |
| Career and College Readiness | Science and technology focused courses are not the only new classes to be introduced at PST. There is also a Postsecondary Preparation sequence of courses that begins with a Keystone course in students' sixth or ninth grade year and continues until their graduation. This course consists of weekly meetings with an individual faculty advisor who guides the student through their entire PST experience. The sequence also includes two Postsecondary Preparation courses, and ends with a yearlong Executive Experience during students' final year. These courses teach skills necessary for postsecondary success; including Keyboarding, resume building and interview skills. They provide students time and support as they study and work to connect to their next step. |
| Professional Development | PST recognizes that excellent teaching, by highly trained and dedicated instructors, is the single most important factor in determining its success. Therefore, the school accepts responsibility for creating systems that encourage professional growth and creativity <i>without</i> adding to teachers' significant workload. <ul style="list-style-type: none"> • All teachers at PST have at least one daily eighty-minute Professional Period. • Teachers are paid for full eight hour work days. • The on campus Professional Education Program allows teachers to rotate annually through one quarter of structured, collaborative professional development during the school day. Teachers practice new skills, participate in lesson study, and meet development requirements in a way that is individualized and meaningful for what is happening in their classroom. |
| Partnership Development | Sustained community partnerships further separate PST from traditional secondary options. Pittsburgh Science and Technology seeks to pilot a new, structured system for partnership formation. Teachers and students regularly collaborate with university, community, and industry partners to provide uniquely authentic and applied learning opportunities. There are several levels of partnership. One of the most important involves an organization, university, or industry working with students for an extended activity at each of three phases of their learning experience. |
| Extracurricular Activities and After School Sports | PSTHS students can participate in sports at the high school in their neighborhood, as is currently the case at the Center for Creative and Performing Arts (CAPA). The school also expects to offer a range of after school programs. However, in addition to these standard offerings, the PST schedule includes a school wide support and activity period. This daily 66 minute period, organized in ten week blocks, allows students access to flexible periods of academic support, fitness opportunities, and the chance to extend specific academic projects. |

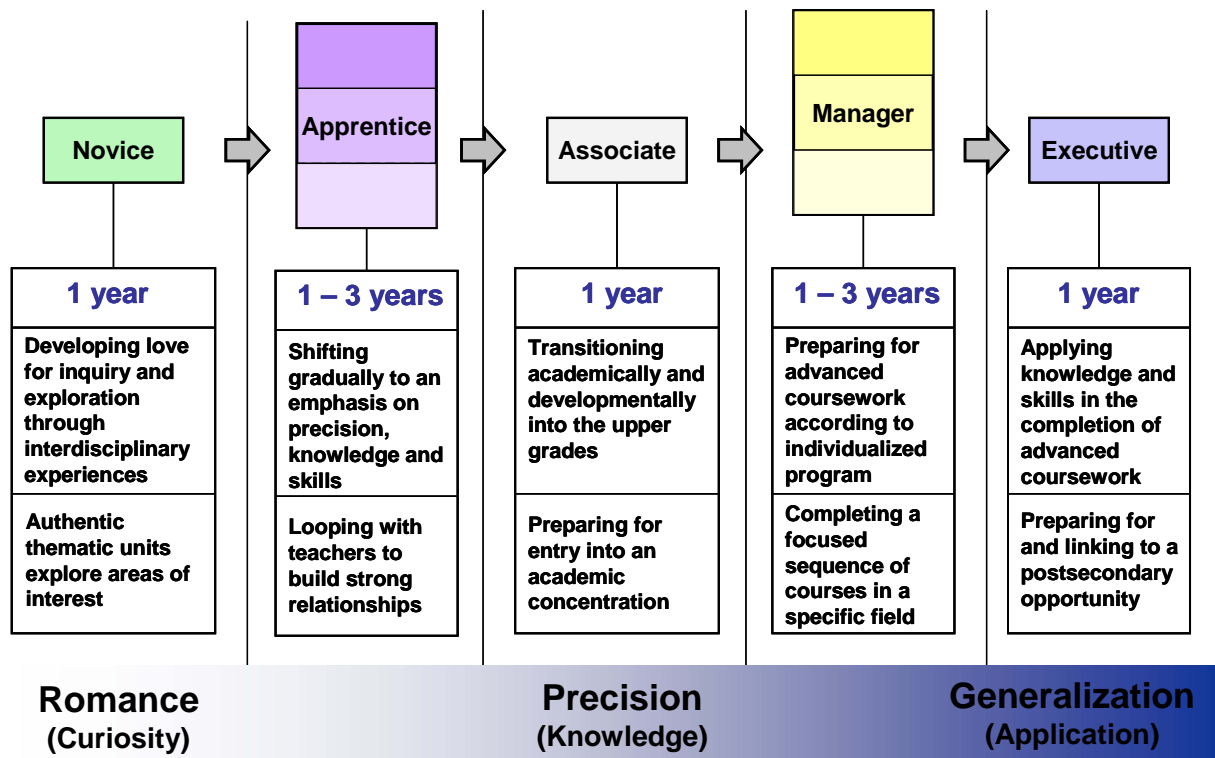
Organizational Structure

An innovative organizational structure is required since PST seeks to challenge students who are already well prepared academically, while also changing the academic trajectory of those who enter the school working below grade level. Thus, the organizational structure of PST looks very different than that of a traditional secondary institution.

The first major difference is that there are no traditional grade levels. Instead, students move through five levels, with two primary points of entry. Approximately half of all PST students will enter the school after fifth grade. These students participate in the Keystone Program. The other half of PST students enters the school after completing the eighth grade, and only participates in the upper grades or “Professional Program.”

Three “anchor” years are associated with important academic and developmental transitions. The anchor years are roughly correlated with what is traditionally sixth, ninth, and twelfth grade. Each of these levels is designed to be completed in one academic year. The anchors surround two more flexible levels that encourage students to move at a personalized pace.

A five-level structure allows students to complete sixth through twelfth grade in as few as five years or as many as nine. All students graduate when they are academically and developmentally prepared to succeed in a postsecondary opportunity.



Students participating in the Keystone Program begin their PST program at the Novice Level. After completing this anchor year they move to the Apprentice Level. They may remain at the Apprentice Level for one, two, or three years, according to their individualized academic program. When students demonstrate academic and developmental readiness they are promoted to the Associate Level, the second anchor year.

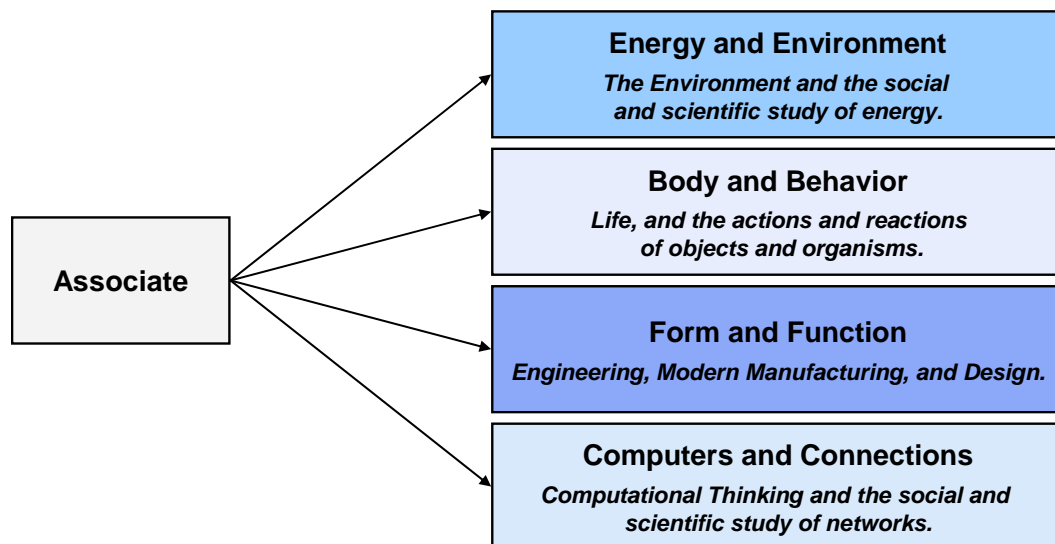
The Associate Level marks the beginning of the Professional Program, and serves as the second entry point for students. After completing this one year level, students move to the Manager Level. Like the Apprentice Level, students may remain at the Manager Level for one, two, or three years as they progress through an adaptive curriculum designed to prepare them for advanced coursework. Ultimately, after demonstrating the ability to succeed in advanced coursework, students are promoted to the Executive Level.

The levels are designed to be a continuum that includes interconnected support systems. Each level is carefully aligned with:

- The levels that surround it;
- The developmental transitions of students; and
- The progression of learning as articulated by Alfred North Whitehead.

The Novice Level aims to develop curiosity, interest in science and technology, and an enthusiasm for learning, elements of the essential educational stage which Whitehead referred to as “**romance**.” Gradually the curricular emphasis shifts to **precision** at the Apprentice, Associate, and Manager Levels. Students acquire specific skills and standards-based content area knowledge in mathematics, history, technology, English, and science. Finally, the Executive Level emphasizes **generalization**, the application of skills and knowledge.

Students enter one of four **SciTech Concentrations** after completing the **Associate Level**. These concentrations have been tentatively identified with the help of regional experts and secondary research.



PST offers four Science and Technology focused **academic concentrations**. Each PST student enters one of these concentrations upon completion of the Associate Level. The concentration is a sequence of seven core courses designed to move students to advanced coursework in a general field of science and/or technology. As the curriculum section explains, these sequences are practically and philosophically aligned with the overall organizational structure. Concentrations are also a physical “cluster” of classrooms and labs.

The academic concentrations are still being developed, but were tentatively identified as the Energy and Environment concentration, the Form and Function concentration, the Body and Behavior concentration, and the Computers and Connections concentration.

Students are promoted to the **Executive Level** when they demonstrate readiness for advanced coursework. At this level they finish their PST program by completing the four types of required advanced coursework:

- (1) Interdisciplinary;
- (2) Concentration specific;
- (3) Applied and;
- (4) Postsecondary preparation.

The school day and school year are structured carefully, in order to maximize “time-on-task”. PST operates using a unique five period block schedule. This schedule includes four 80-minute academic periods and a 99-minute support, enrichment, and activity period. **Courses are offered in three different lengths to increase adaptability; yearlong, semester-length, and “mini” or quarter length courses.** Teachers have at least 149 minutes per day without students, and rotate through an additional period of Professional Education, which they participate in for one period during one quarter of each school year.

Additional components of the organizational structure contribute to the achievement of the identified goals. A set of guiding principles establishes consistently high expectations for behavior and interaction. **A Parent Center, College and Career Center, and Professional Development classroom** provide space for these important functions. They make it very clear that professional development and community engagement are priorities, not secondary functions. These spaces are designed to facilitate communication and accountability between staff, families, and community partners. A diverse set of summer programs, including internship opportunities, ensures that students continue academic and career development throughout the calendar year.

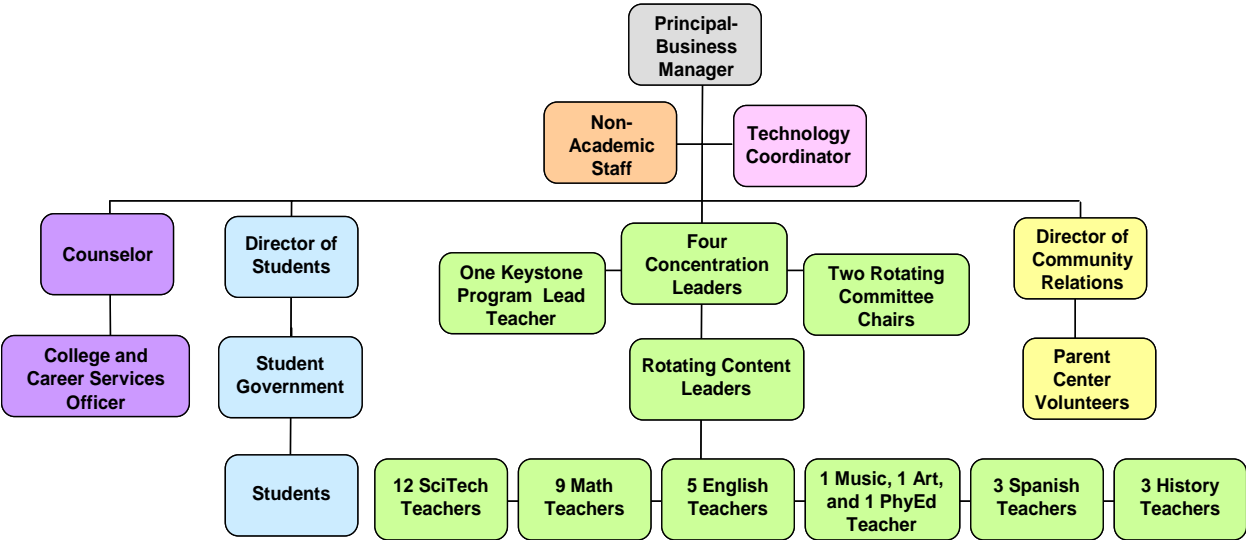
Staff and Administrative Composition and Responsibility

Standardized testing and improved data collection have begun to allow researchers to isolate the “value-added” of a single school,¹⁵ or single teacher, with increased methodological validity. The results of these studies, one of which demonstrated a 35 to 40 percentile point single school year effect between the most effective and least effective teachers¹⁶, has led The Education Trust to conclude that teachers are the single biggest factor in determining the achievement of a student, greater even than poverty, race, or parents’ education level.¹⁷

The quality of the teaching staff, and of daily instruction, will determine the success of PST more than any other factor. Therefore it is essential the school attract, develop, support, and retain the best teachers and administrators. PST intends to compete for qualified professionals through thorough marketing and hiring processes, but also by creating *an exciting work environment that minimizes isolation, frustration, and fatigue*. Teachers are treated like professionals and expected to produce professional results.

In order to create a collaborative environment, and maximize efficiency, administrators share teaching responsibilities and teachers have leadership roles. Administrators teach one non-traditional class per quarter. A **Faculty Council** consists of the four concentration leaders, the Keystone Program chair, and the chairs of the Discipline and Activities committee. Leadership of the Discipline and Activities committees may rotate annually.

The **Organizational Chart** creates positions not found in most comprehensive high schools, while rethinking the job description of traditional positions.



¹⁵ Gill, B., Engberg, J. & Booker, K. (2005).
¹⁶ Haycock, K. (1998).
¹⁷ Carey, K. (2004).

There are several non-traditional professional positions.

Director of Faculty – The instructional leader and coordinator of professional development also teaches the Professional Education Program (PEP) course during third period. They evaluate performance of faculty members and monitor progress toward development goals. They are a member of the Faculty Council and organize PSSA testing and data management.

OR:

Director of Student Affairs – In charge of reinforcing the guiding principles, the Director also monitors student learning goals and individual programs, following progress through levels and concentrations. The Director is responsible for managing the admissions process and teaching a course each mini. They also work directly with the student government.¹⁸

Director of Community Relations – Deeply embedded partnerships are critical to the success of the school. The Director develops and manages these partnerships. He or she also manages the Parent Center, maintaining a staff of parent volunteers. The Director is a community advocate for the school, managing marketing and recruiting.

College and Career Services Officer – Traditional counselors are often too overwhelmed with daily personal and discipline issues to concentrate on college and career connections. PST seeks to separate these responsibilities with two positions. This officer connects students to scholarships, summer internships, and other programs.

Concentration Leaders – The four Advanced Science teachers, one from each concentration serve as Concentration Leaders. These four professionals share a planning period, facilitating collaboration and insuring that good ideas spread across concentrations. Concentration Leaders also serve as school wide curriculum leaders, managing curricular alignment.

The Keystone advisory period and administrators teaching courses are two examples of the non-traditional responsibilities for staff members with traditional job titles.

Keystone Advisory – Each teacher serves as an advisor to a group of approximately 10 students. They follow this group of students from the beginning to the end of their PST experience and meet with them each Wednesday during third period. Responsibilities of the Keystone advisor include helping set college and career goals, scheduling courses, deciding how to best use third period, and designing three, four, or five year programs. **The advisor also serves as a point of contact for the parents or guardians of their advisees.**

Teaching Administrators – Each of the six PST administrators (The Principal/Business Manager, Director of Faculty, Director of Student Affairs, College and Career Services Officer, and the Technology Coordinator) teaches at least one nontraditional course per mini.

¹⁸ The strength of the principal will determine which of these positions we hire. If the principal's strength is instructional leadership we will hire a Director of Student Affairs. If their strength is in student management we will hire a Director of Faculty and the Principal will be responsible for managing Student Affairs.

Professional Development

Only professional development that is sustained and time-intensive has the ability to improve instruction, impact student achievement, and contribute to teacher retention.

In order to overcome the challenges associated with developing and retaining high quality teachers, the Professional Development System:

1. Provides an intensive amount of flexible but focused time-on-task;
2. Creates systems of consistent collaboration and support;
3. Supports technology integration and 21st century skills instruction; and
4. Measures results in order to hold teachers accountable for student achievement.

The **6 core components** identified below encourage teachers to develop individually, while holding them accountable for improving student achievement.

| Component | Description |
|---|---|
| Professional Education Program (PEP) | One quarter each year of structured daily professional development during third period focused on lesson study and technology integration |
| Planning Weeks and Clerical Days | One week in the summer and one week between semesters of long term planning |
| Common Planning Periods | Eighty minute daily planning period shared by teachers working in the same concentration |
| Alternate Wednesdays Early Release Days | Students leave early every other Wednesday, development meetings by concentration, content area, level |
| Individual Development Goals | Developed in the summer, monitored by Director of Faculty |
| Comprehensive Evaluation Systems | Formative and summative assessments, "value-added" measures |

The six primary components are supplemented by monthly after school administrative meetings, and a mentor/professional development partner program as well as a voluntary summer retreat for all school staff members and a voluntary weekly lesson study session.

Teachers are contracted for eight-hour days, adding time-on-task and ensuring that each teacher will have at least 149 minutes per day (199 during their PEP mini) for personal and professional development. This time includes an 80-minute planning period, a 30-minute lunch, and 39 minutes of contracted time before or after students arrive at school. This system is based on evidence that teachers with more time for both independent and structured planning, administrative duties, and professional development teach better lessons, exhibit higher levels of job satisfaction, and increase student achievement. In order to insure that the teachers hired will utilize this time a rigorous hiring process is outlined in the full report.

Curriculum

The curriculum integrates the unique elements of PST, creating a system capable of accomplishing school wide goals. The replacement of the traditional grade structure with a five-level system allows students to complete coursework at an appropriate pace. Four SciTech concentration sequences explore subject areas not normally available to high school students. Block scheduling and the combination of yearlong, semester-length, and “mini” (quarter-length) courses allows for greater flexibility in scheduling.

An adapted version of Alfred North Whitehead’s “rhythms of education” guides the design and implementation of the PST curriculum. Whitehead describes three essential stages of education. He argues that all learning should progress through each of the following stages.¹⁹

- A. **The stage of romance**, when the subject matter has “the vividness of novelty” and the excitement of unexplored connections.
- B. **The stage of precision**, when “width of relationship is subordinated to exactness of formulation”. This stage is deemed the “stage of grammar”, the grammar of language and the grammar of science. According to Whitehead, precision is nothing without being preceded by romance because there must be a broader context for the facts and a general understanding of their context.
- C. **The stage of generalization** or synthesis. This stage is “a return to romanticism” with “the added advantage of classified ideas and relevant technique”.

The graphic below outlines how Whitehead’s ideas have been adapted and applied to the PST curriculum.²⁰ The full PST curriculum, and also its units, and daily lessons will be designed and implemented according to three stages; (1) Curiosity, (2) Knowledge, and (3) Application.

| Original Rhythms of Education | Modified Key Words | Lessons | Units | Full PST Program |
|--|--------------------|--|--|--|
| Romance “the vividness of novelty” and the excitement of unexplored connections | Curiosity | Open lessons with a “hook” that inspires curiosity | Generate questions | Emphasize curiosity, exploration, and experience at the Novice Level |
| Precision “width of relationship is subordinated to exactness of formulation” | Knowledge | Present and practice new skills and/or information | Acquire knowledge and skills | Emphasize information and skills at the Associate Level |
| Generalization “a return to romanticism” with “the added advantage of classified ideas and relevant technique” | Application | Apply new information/skills to real situations or new types of problems | Apply knowledge and skills to answer questions through inquiry driven projects | Emphasize application and inquiry at the Executive Level |

¹⁹ Whitehead, A. N. (1929). *The Rhythms of Education. The Aims of Education and other essays.* New York, NY, The Free Press, A Division of Macmillan Publishing Co., Inc.: 13.

²⁰ Alfred North Whitehead’s Rhythms of Education are explained in the previous section of this document.

The **Novice Level** focuses on developing curiosity, creativity, fascination with science and technology, and a general love for learning. Authentic experiences and extended thematic units supported by community partners expand students' worldview and empower students by encouraging them to become experts in areas that appeal to their interest and personality.

Units emphasize connections between technology, science, and community, giving students real opportunities to better their city while learning about authentic applications of the skills and knowledge that they will later access at a high level. At the same time students will be learning specific standards based math, reading, and writing skills necessary to support their transition from this romance phase to one with greater emphasis on specific skills.

The **Apprentice Level** allows students to further explore areas of interest discovered at the Novice Level, but gradually shifts emphasis from romance to precision. Students spend this entire level, which may last one, two, or three years, with the same group of teachers. These teachers lead individualized programs in writing, reading, mathematics, and technology. **Skills and information are emphasized throughout this level.** Technology programs facilitate the individualization of instruction and allow students to move at their own pace. Teachers follow their students through this level, and spend as much time as facilitators or academic coaches as they do as traditional instructors.

The **Associate Level** is designed to provide a challenging body of coursework for students entering PST from the Keystone program and also from K-8 or 6-8 programs. The Level includes opportunities for enrichment and intervention according to individual academic need. Students master the skills necessary for eventual success in advanced coursework in a personalized environment. The Associate Level includes:

- A yearlong Science/English interdisciplinary experience that teaches writing and research skills through inquiry-based Physics, Chemistry, and Biology explorations;
- A yearlong Specialized Mathematics course, combined with a structured support period for intervention and enrichment, providing all students with the mathematics foundation necessary for success in applied sciences;
- The opportunity to develop a sustained positive relationship with a cohort of 23 students and three teachers; and
- The continuous development of an individual plan in partnership with a Keystone faculty advisor who will work with the student throughout PST.

Support and positive relationships are emphasized at this critical anchor year. Students begin the postsecondary preparation sequence, learn about and select from the concentrations offered at PST, and work with their advisor, teachers, and family to begin designing the next two, three, or four years of their program.

The **Manager Level** continues the path towards advanced coursework, while providing increased choice and flexibility. The adaptable curriculum allows students to complete necessary coursework at an appropriate pace, allowing for completion in as little as two semesters and as many as six. It is anticipated that most students will complete the level in four semesters. Highlights of the Manager Level include:

- The beginning of concentration coursework sequences, including the Introductory Course and Rotations;
- The development of Digital Portfolios;
- The first Postsecondary Prep course, an introduction to SAT preparation and college and/or job searches.

During their first year at the Manager Level students begin their concentration sequence. The Introductory Course builds basic skills and provides preliminary exposure to specific disciplines within each concentration areas. The Rotation Courses address major disciplines within the field of study through intensive project-based experiences.

At the **Executive Level**, students integrate learning from the previous levels, applying their skills to real-world situations. At this level students complete four types of advanced coursework. Four specific courses work together to provide a balanced culmination to the rigorous PST academic experience.

- **The Capstone course** is an interdisciplinary course taken by all Executives integrating the body of knowledge acquired through the entire PST curriculum. This course meets the interdisciplinary advanced coursework requirement.
- **The Advanced Science Course** is a concentration specific opportunity for the integration and application of knowledge acquired within each concentration. This course meets the concentration specific advanced coursework requirement.
- **The Postsecondary Prep II Course** is a semester length opportunity for students to research, apply for, and connect to their postsecondary opportunity. This course meets the postsecondary preparation advanced coursework requirement.
- **The Executive Experience** is a yearlong sequence consisting of two components, an Independent Study and a group-based Executive Project designed to apply new skills to relevant real-world projects. This course meets the real world application advanced coursework requirement.

Outside of these four requirements, Executives will have the greatest amount of flexibility in scheduling. A total of 81 courses are offered at PST.

Science and Technology Concentrations

The concentration sequence, like the rest of the PST curriculum, is designed to connect students to postsecondary opportunities. Strategically selected, the concentrations teach in demand skills relevant to emerging or established sectors of Southwestern Pennsylvania's regional economy. A sequence of at least seven courses moves all students to advanced science coursework.

The four recommended concentrations – **Environment and Energy, Form and Function, Body and Behavior, and Computers and Connections** - balance exposure to a broad range of tools and concepts with continuous opportunities for in-depth inquiry.²¹ They also operate in “Pasteur’s Quadrant.” That is, the concentrations are based on the theory that scientific exploration should be inspired both by considerations of use *and* by a quest for fundamental understanding. Science and technology are not separated, with one being the product of the other, but they are taught together. Therefore, at Pittsburgh Science and Technology, inquiry driven projects seek to integrate the practical with the purely scientific.

Students gain a deep understanding of the core topics in their concentration, acquire broad knowledge of the scope of topics and careers, and apply their skills and knowledge to real-world problems. Rigorous and authentic courses teach concrete skills that are relevant to postsecondary goals. Upon completion of their concentration students will be prepared for college study or ready for employment in a skilled position in the region.

The concentration sequence is designed to resemble an hourglass, again following the pattern of curiosity generation, knowledge and skills acquisition, and ultimately application of knowledge to new and authentic problems or experiences. There are seven required courses in each concentration, referred to as the “core” courses. There are eight supplemental courses that may be taken either within or outside of the selected concentration. The concentration courses are outlined below.

Core Courses:

1. **One quarter-length introductory science course** provides broad, applied knowledge of basic concepts in the concentration. This course is taken at the Manager level.
2. **Five quarter-length “rotations”** delve more deeply into applied concepts in many of the topic areas pertinent to the field. Most students will start and finish these rotations at the Manager level.
3. **One semester-long advanced science** course returns to the macro level, integrating theory and application from several of the rotation topic areas. Students take this course at the Executive level.

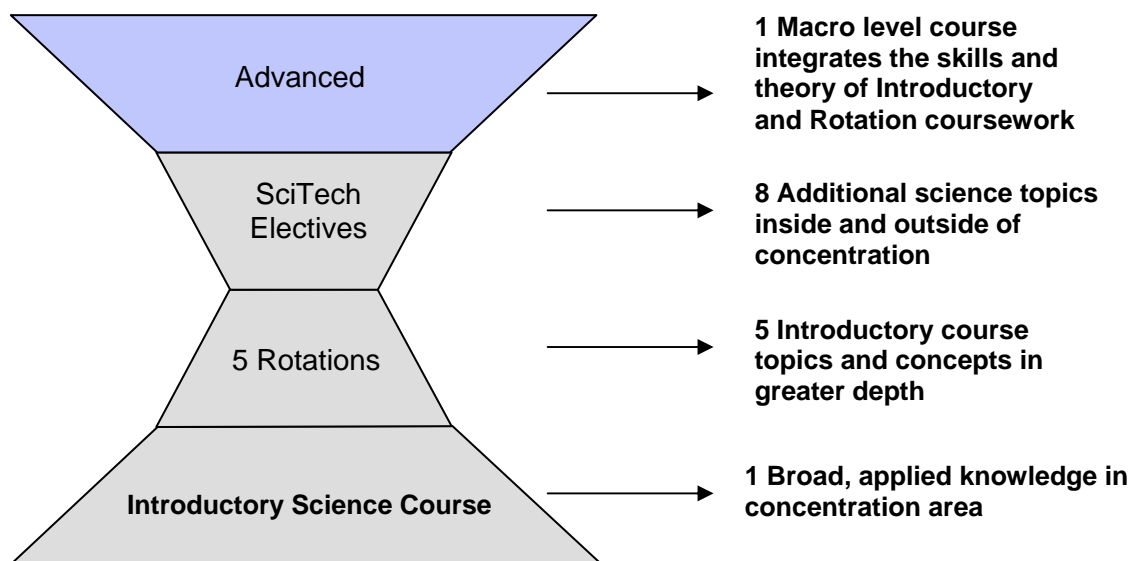
²¹ These concentrations are only tentatively identified. Focus groups and expert input from industry and education experts will finalize these concentrations.

This sequence of core courses gradually prepares each student for advanced work in their selected discipline while providing opportunities for individually driven inquiry in five academic and/or technical areas related to their concentration.

Supplemental Courses:

1. **Four quarter-length electives** are offered, one within each concentration. These may change to reflect student interest and may be taken within or across concentrations.
2. **Four semester-length electives** are offered, one within each concentration. These courses may be taken within or across concentrations.

The **science and technology concentration sequence** includes 7 core and 8 elective courses, moving students toward advanced coursework.



Eight PST teachers work in a concentration, two teachers per concentration. Each team of two teachers is responsible for developing, teaching, and continuously evaluating their concentration. One member of the team teaches the Introductory Course, Rotations, and SciTech Elective Minis. The second teacher teaches the Advanced Science courses, Capstone courses, and SciTech Elective Semester courses. Although they may teach as many as eight different courses in one school year, concentration teachers never teach more than two courses at a time. Due to the significant amount of responsibility associated with these positions concentration teachers require more planning time than other members of the faculty. Therefore, concentration teachers have two eighty-minute planning periods per day for the entire school year.

A cohort of twenty-two or twenty-three students will enter each concentration at the beginning of each year. This group of first year Managers will move together, as a cohort, through their Introductory Course and five Rotations. They will have the same teacher for each of these

courses, facilitating the establishment of close personal relationships. Upon completion of the Rotations, some students from the cohort will move directly to the Advanced Science course at the Executive Level. Other students from the cohort will take additional SciTech electives as they complete the acquisition of the prerequisites necessary to succeed in the advanced course. The number of students in each concentration will fluctuate with the population of the school. Simulations suggest that concentration populations will range between 60 and 80 students depending on the number of students graduating in three, four, and five years. Schedulers must work carefully to plan students' programs with significant foresight.

The PST Schedule

Pittsburgh Science and Technology will run a 5-period block schedule for a seven-hour, twenty-one minute extended school day, including passing times. Extended school days of this length are already in use in Pittsburgh in the Accelerated Learning Academies.

Periods 1, 2, 4, and 5 will be 80 minutes. Period 3 will be 99 minutes. Students will have a 33-minute lunch period in one of two lunch shifts during this 99-minute block.

The schedule insures that teachers have a unique amount of planning time, providing the time necessary to design consistently engaging lessons. All 29 PST teachers enjoy a daily 80 minute planning period. Some teachers, specifically teachers within SciTech concentrations and those who teach the Associate Level English/Science interdisciplinary course, have two 80 minute periods reserved for planning. In addition, all teachers rotate through the Professional Education Program (PEP), spending one third-period mini in PEP each academic year.

Rotation teachers lead eight different classes each year. They have **more than three hours of daily planning time.**

| Teacher – Social/Decision Science – Teacher #17 | | | | | |
|---|--------|-------------------------------|------------|-------------------------------|------------------------------|
| Period | Length | Semester 1 | | Semester 2 | |
| 1 | 80 | Concentration Common Planning | | Planning | Advanced Science Mini |
| 2 | 80 | Intro to Soc/Dec Science | Rotation1 | Rotation 2 | Rotation 3 |
| 3 | 99 | Support | PEP | Running Club | Statistics and Bird Watching |
| 4 | 80 | Rotation 4 | Rotation 5 | AdvSci Mini | Planning |
| 5 | 80 | Planning | | Concentration Common Planning | |

The schedule also supports the development of sustained positive relationships. No teacher will see more than 75 students in one day, with a number of teachers seeing less than 50. Often teachers will have the same student for several courses over two, three, or four years.

Courses are offered in three different lengths to maximize student choice and scheduling flexibility and to increase time for professional development. Yearlong courses will include an integrated Physics/Chemistry/Biology/English course and Specialized Mathematics at the Associate Level. The integrated Sciences/English course is a yearlong course sequence required for all students at the Associate Level. Specialized Mathematics will also be offered in a yearlong format to all Associate Level students.²² **A yearlong section of all subsequent math courses is available for students who would benefit from the pace and support of a year-long, block-scheduled course.**

Students who do not need the additional support made possible by the year-long class have the opportunity to move through their math sequence in a series of semester-long courses. Outside the concentrations History, English, Foreign Language and SciTech electives will be offered in semester length classes.

The schedule is also designed to accommodate “mini,” or quarter-length, courses. Required courses such as Art, Gym, Music, and Health will be offered as minis. Introductory concentration courses and the five concentration rotations are minis. English and SciTech electives include both mini and semester length opportunities.

At the Novice and Apprentice Levels there is additional flexibility since students share the same teachers for their academic subjects. This allows groups of three teachers to work together to adjust their schedules as necessary to provide the authentic experiences and individual support that are the emphases of these respective levels.

Period 3 – Support, Enrichment, Activities, and Professional Education

Period 3 is a school-wide activity period. Surrounded by four 80-minute academic blocks, this 99-minute period includes two 33-minute lunch shifts and two corresponding 66-minute activity periods. The activity period is organized by mini, making it possible for all students to participate in four different activities during each academic year.

At the Novice and Apprentice Levels activities and clubs are emphasized, with support and enrichment opportunities available for students requiring intervention or interested in extending a learning experience.

²² Incoming Associates will have the opportunity to take an examination to demonstrate their proficiency in Algebra I. Students who demonstrate proficiency may exempt Algebra I and begin in Geometry in the first semester of their Associate Level.

At the Associate Level, choice of activities is limited to support, intervention, and enrichment. Students will attend the appropriate course depending on their academic needs as determined in consultation with their Keystone advisor.

At the Manager and Executive Levels, teachers schedule minis in response to student input and changing needs. Each mini-length activity will fall into one of five categories:

1. **Academic Support** – Support minis will be available throughout PST. The type of support minis available should be modified each mini to correspond to student needs.
2. **Academic Enrichment** – A mini course might be used to provide further exploration into an academic area that has caught the interest of a group of students.
3. **Homework Lab** – Students who are not in need of intensive academic intervention but would benefit from a flexible work period may participate in a homework lab.
4. **Clubs/Activities** – Each mini, teachers lead clubs in response to student interest. Participation in certain clubs qualifies students for academic credit. For example, a student who participates in the running club could receive a ½ gym credit.
5. **Required Courses** – Students who have designed three year programs will have to use third period to meet certain gym and graduation requirements in at least two minis.

This flexible period adapts to students' changing needs, providing a dynamic break from traditional academic coursework. With the help of their Keystone advisor, students will carefully schedule minis to obtain the continued support they need as they move through the rigorous curriculum. This support will be balanced by the unique opportunity to participate in clubs, activities, and extension exercises normally reserved for after-school programs.

One of the most important benefits of the activity period is that it supports the **Professional Education Program (PEP)**. No teachers will have their individual planning period during third period. Since all adults in the school will be leading an activity (with the exception of lunch staff, secretarial staff, and one administrator), it is possible for teachers to rotate through the PEP program in four groups. This means that each teacher will lead an activity during three out of four minis. The fourth mini will be spent participating in the structured professional development program described in the Professional Development section.

Third period is **a flexible support, enrichment, and activity period** organized by mini and included a rotating development period.

| | Novice and Apprentice | Associate | Manager | Executive | Teachers |
|----------------------|-----------------------|-----------|---------|-----------|----------|
| Support | ✓ | ✓ | ✓ | ✓ | ✓ |
| Enrichment | ✓ | ✓ | ✓ | ✓ | ✓ |
| Homework Lab | | | ✓ | ✓ | ✓ |
| Clubs and Activities | ✓ | | ✓ | ✓ | ✓ |
| PEP | | | | | ✓ |

* PEP is the Professional Education Program, a collaborative professional development period organized in ten week minis and facilitated by the Director of Faculty.

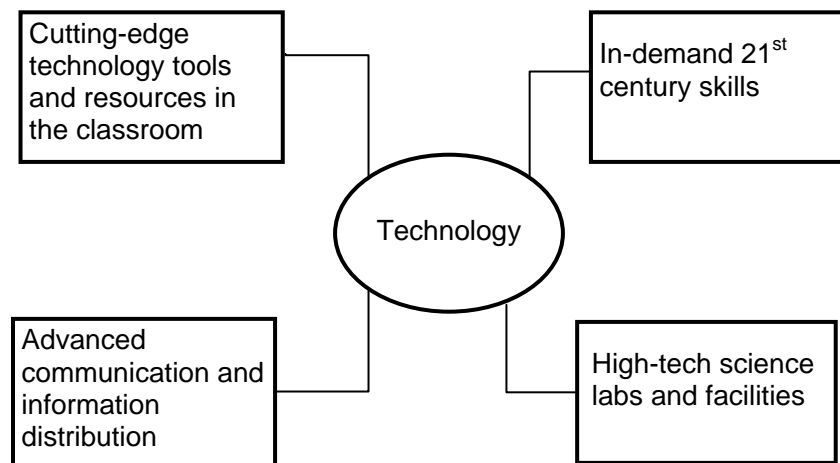
Technology Integration

The technology plan is still being developed with the help of industry and university experts. While it is not necessary that *all* PST graduates attend a four year college or university the PST program is not primarily vocational. **The school is focused on teaching sophisticated, knowledge based science and technology skills, providing the foundation for advanced careers in science and technology industries, from medicine to economics.** At the same time students are acquiring thinking and professional skills that can be applied to any area of personal interest.

Technologies, particularly computer based systems, are integrated into every aspect of the school, from students' coursework to staff and teachers' planning and assessments. Technology will be deeply and directly integrated into the curriculum and also used as an administrative tool, connecting classrooms and staff. In the classroom, the scope of technology goes beyond basic keyboarding to intervention, exploration, and enrichment systems.

The system design emphasizes a strong commitment to professional development, technology training, and technology support on a school-wide level. For students, technology fosters inquiry and increases engagement. It provides constant access to information through a 1-to-1 laptop distribution system and provides curricular support for intervention and enrichment.

Technology Integration means giving students the appropriate tools to learn 21st century skills.



For students to succeed in their postsecondary careers, whether in college coursework or a job, they need to be fully prepared for either path. Employers and universities are requiring high school students to have more than a basic understanding of typing and surfing the Internet. Beyond this rudimentary knowledge, “real” technology skills include an understanding of 21st century communication, teamwork, and problem-solving. The technology resources and integrated framework laid out in the full report aim to develop these skills.

Public and Private Partnerships

To facilitate a relevant curriculum, PST is currently working to establish partnerships with business and academic institutions to support each concentration. As partners, local businesses and academic institutions will work with PST to integrate career education and relevant industry examples into the curriculum. These partnerships will not only increase the relevance of the concentration coursework, but will also enable students to acquire skills that are sought by regional employers. Moreover, a model of engaged partnership among public schools, businesses and academic institutions has the potential to foster mentor relationships among students and businesspeople so that students do not view career education as merely another arduous requirement.

The implementation process to date has made it very clear that there is the need for a better partnership system. Currently it is very difficult to establish or monitor partnerships at the district level. Pittsburgh Science and Technology should be the pilot site for a new, technology supported partnership system. This web and database tool would improve the District's ability to: (1) Define, (2) Prioritize, (3) Communicate, (4) Establish, and (5) Monitor and Evaluate private or public partnerships.

Partners with PST will be organized in six categories:

- Communication and Marketing;
- Curriculum and Professional Development;
- Support and Extension Activities;
- Financial, Equipment, and Infrastructure;
- Evaluation and Consultation; and
- Volunteers.

Within each of these categories specific opportunities are articulated and the responsibilities of a partner are clearly defined. This process improves communication and helps all parties understand the expectations, also making it easier to evaluate the success of the partnership.

PST seeks to establish content specific partnerships at each level in each concentration. These partnerships should allow students to authentically experience the connections between science, technology, and community. They should involve students in the work of the organization or university partner beyond a single field trip or guest speaker. Students should work closely with the partner organization throughout the unit, with clearly defined outcomes identified and opportunities for ongoing involvement with interested students.

Benefits of these relationships will accrue to all members. Regional businesses will benefit from the development of the regional employment pool, connections to each other, and the publicity that will be generated by the partnership. Students will benefit from the resources, relevance, and connection to the employment market provided by their relationship with regional employers. Teachers will benefit from their relationship with practitioners. PST will benefit from its students' success.

Conclusion

Breakthrough urban secondary schools range in size, geographic location, and academic focus, but they share a set of important characteristics. Each creates a personalized environment, has strong leadership and support structures, facilitates collaboration, and implements a rigorous curriculum. Even more importantly, each of these schools has a specific plan for leading their students from their first day of school to high achievement, graduation, and postsecondary opportunity.

This executive summary outlines such a plan. With the challenges facing urban high schools in mind, the key elements of this system create an orderly learning environment, encourage the development of positive relationships, establish an authentic and adaptive curriculum, and ensure effective instruction. United by a relentless commitment to the student outcome goal, these systems form a continuum of support that allows all students to access and succeed in advanced coursework, whether they enter the school at the after the fifth grade or after the eighth grade. The foundation is established for a breakthrough Pittsburgh high school.

There are many steps that must be taken in order for the school to open in 2009. The location must be designed and prepared. A highly qualified and motivated staff must be assembled. The significant number of new or supplemented courses must be developed. An equitable admissions process must be designed. An outreach program must communicate the merits of this opportunity to parents seeking the best option for their high school or middle school age child. The community must be engaged and their input used to improve the design.

The full report and the revised curriculum section finished in May 2007 contain additional details about each component of PST. A master schedule has been created that links teachers and teaching administrators to courses, and courses to period. A comprehensive course list has been created, and can be finalized as the concentrations are determined and community input considered.

With the support of the city and the development of partnerships Pittsburgh Public Schools is optimistic that this school can open, with these and other innovations intact, in August of 2009. This school will be the first of number of new, forward thinking choices for the students and parents of Pittsburgh as high schools are redesigned to align with the expectations of the 21st century economy.

Prepared for Pittsburgh Public Schools,
Mark Roosevelt, Superintendent

This document is based on, and draws directly from, a report originally written by the Systems Synthesis Team advised by Dr. Michael Johnson and Dr. Gordon Lewis in December, 2006 at the H. John Heinz III School of Public Policy and Management, Carnegie Mellon University. It is also based on an independent study advised by Dr. Michael Johnson, completed in May, 2007.

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