

Creating a Standards-Based Curriculum: The Princeton Charter School Story

Maureen P. Quirk

Princeton Charter School
maureen.quirk@mac.com

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1 Introduction

Princeton Charter School's curriculum [2] was developed to provide students a thorough and efficient education through mastery of core knowledge and skills. The curriculum as it stands today is the result of the work of many individuals over a number of years. PCS is proud of its excellent academic program; in April 2002, we became the first charter school in the nation accredited by the American Academy of Liberal Education. In awarding PCS accreditation, Jeffery Wallin, the President of the American Academy for Liberal Education congratulated PCS on its "manifest commitment to an academically demanding program" and stated that PCS has achieved "the highest standards we are aware of in the whole realm of K-12 education." The AALE further noted that the excellence of the PCS academic program will stand as a model in the accreditation of other charter schools. This presentation will cover the principles and methods we used to develop and refine the curriculum.

Briefly, the process was that first we developed our vision of what an accomplished graduate of the school would know and be able to do; then we researched what other good schools taught; and from these we developed an overview of our program in each academic area. For each of the *New Jersey Core Curriculum Content Standards (NJCCCS)* [3], we then specified what our students in grades four and eight would accomplish. This overall view of our program is written into our charter [1]. To develop the curriculum in more detail, we formed a committee for each subject area; these committees developed into our current curriculum committees. Each committee developed a set of outcomes for every grade, researched and adopted instructional materials, and wrote one- or two-page course descriptions that provided a guide for teachers and parents. We distribute these course descriptions to parents at back-to-school nights, and on our web site; they help all the members of the community to focus on what we plan to accomplish in a year.

When we began to write our charter we agreed that we wanted the school to focus on academics; we wanted a school where children could learn in an atmosphere that supported academic achievement. To accomplish this we adopted the following principles:

1. rigorous curricula, with well-defined grade-by-grade outcomes in line with state, national, and international standards, that focus on cumulative acquisition of knowledge and skills in academic areas;
2. teaching methods that provide children the support and challenges they need to master grade-appropriate skills, ideas, and facts in every subject area;
3. integrated formal assessments to confirm student progress, to promptly identify situations that require intervention or greater challenge, and to guarantee accountability of the school;

4. a school atmosphere that encourages academic achievement, recognizes the importance of hard work and personal responsibility, and holds out high expectations for every student and teacher – while fostering fairness, respect for others, and recognition of the rights and responsibilities of citizenship in a democratic society; and
5. timely and complete communication with parents about their child’s progress.

1.1 Specific Objectives

To develop our academic program, we realized that we needed to keep in mind what we would expect a well-educated eighth-grade student to know. We developed the following objectives for our graduates:

- Students will develop clear and effective written and oral communication skills using standard English.
- Students will acquire a strong foundation in mathematical reasoning and skills.
- Students will learn about the political, economic, cultural, geographic, and technological forces that have shaped the history of the world and of the United States.
- Students will acquire knowledge and skills in the sciences and will be able to conduct inquiries using the scientific method.
- Students will develop an informed appreciation of the arts and participate in their creation.
- Students will be able to speak, read, and write in a language other than English.
- Students will learn the essentials necessary for a healthy, safe, and physically fit life.
- Students will recognize the importance of hard work, personal responsibility, and respect for others.
- Students from all demographic groups will perform at comparably high achievement levels.

Our curriculum today is described in a document that is about 160 pages long. There are sections describing our philosophy and teaching principles, our use of assessment, and our student achievement milestones. Then, for each subject we have the overview from our charter, the accomplishment of the *NJCCCS* for grades four and eight, grade-by-grade student outcomes, and the course descriptions for each grade.

Before going into the specifics of how we developed our curriculum, it is helpful to consider why we felt we needed to form Princeton Charter School.

1.2 Background: Why Princeton Charter School?

In order to illuminate some of the principles we used, I will address the question we were asked so often, Why Princeton Charter School? Why a charter school in a community that prides itself on high SAT and other standardized test scores: a community that presents an accomplished front to an external viewer? The answer is that the public schools in Princeton are not exempt from the ills that plague public schools in communities across the nation. Here, as in many communities, the educated parents provide a large amount of the academic instruction their children experience. It seems that many public schools are afraid to provide the challenging material that must be part of a strong education.

Princeton Charter School views a young learner’s early years as a precious resource not to be squandered. These are the years in which a solid academic foundation must be built. The failure to challenge adequately this age group is a national problem identified in numerous reports over the last few decades. By fourth grade, wide gaps in achievement emerge that cannot be explained by variations in ability alone. Disturbingly, but not surprisingly, these gaps often correspond to children’s

socioeconomic differences and varying levels of parental support. Some are created by inconsistent or even ineffective treatment of core areas such as language arts and mathematics. Today, many students never overcome these differences, and both the student and society pay a price. Princeton Charter School cannot hope to erase achievement differences entirely, but it believes that a stronger education program will significantly ameliorate them.

Some schools sacrifice high expectations for fear of undermining student self-esteem. Princeton Charter School believes that knowledge must come first; only through meeting challenges arising from a sequential and cumulative curriculum, with a significant focus on ideas, skills, and knowledge, do children acquire genuine self-esteem. Serious education must begin earlier than is fashionable today – before the learner is faced with the complexities of approaching adulthood.

Parents in Princeton spent many years trying to reform the system from within but made little progress. When the Charter School Program Act of 1995 was passed into law in New Jersey, we saw an opportunity to make a difference to the children in the schools now, rather than a generation from now. A more detailed account of the founding of PCS is given in *Why Charter Schools? The Princeton Story*, by Chiara R. Nappi, available from the Thomas B. Fordham Foundation at <http://www.edexcellence.net/library/wcs/wcs.html>.

2 Research

To create a coherent, effective, and rigorous academic program, we researched those of other successful schools. We did not limit ourselves to schools in the United States; we also gathered curricula from other nations, particularly in mathematics and science. As part of my work drafting sections of the New Jersey Mathematics Framework, I had gathered mathematics curricula from local public schools, from the states of Ohio, Iowa, and California, and from Japan, the Soviet Union, Australia, and France. Amazingly, it is much easier to get down-to-earth material from other countries than from the United States. Much of what is available from U.S. schools and state departments of education is in the form of frameworks or guidelines, rather than straightforward statements of topics and outcomes. In contrast, to obtain a curriculum from another nation, I simply called the embassy and asked to speak with the education officer. This officer was usually excited that someone was interested and sent me useful materials right away. The most extensive information available is from the former Soviet Union, since the University of Chicago Mathematics Project has translated much of the material from Russian to English and published it in book form. (see the Reference section at the end of this paper).

To illustrate the difference between the material from U.S. schools and others, I like to use the multiplication tables. In every nation except for two, the multiplication tables are memorized in grade three. The two exceptions are Japan, where the multiplication tables are learned in second grade, and the United States, where most curricula never mention memorizing them at all! I love the following quote from an introductory algebra book [14] originally published in Russian, ‘If, on being asked, What is seven times eight?’ in the middle of the night, you cannot answer ‘Fifty-six!’ immediately, and instead try to add up seven eights half-asleep, we are unable to help you.’ Since mastery of multiplication is required to move beyond arithmetic, by refusing to have children memorize their multiplication tables, American schools create a closed door rather than an open gateway for students.

The research from the Soviet Union on teaching mathematics to children in the primary grades included an article about how meager and lackluster the geometry in textbooks was in the 60s in the Soviet Union. Anyone reading this article who was familiar with U.S. textbooks would find it applies to our textbooks today. (I like to joke that geometry is always chapter 10 out of 13 chapters and gets short shrift as teachers reach the end of the school year.) Geometry problems in textbooks were too few and too many were an excuse for arithmetic practice. Mathematicians worked with educators to revamp the Soviet textbooks, incorporating a lot of intuitive geometry, so that 20% of the problems in the new textbooks used geometry. This research article, and all the geometry problems from the Soviet textbooks are available in a single volume from UCSMP [11].

The Russian mathematicians referred to the seminal work of the Dutch educators Dina van Hiele-Geldof and Pierre van Hiele who analyzed the progression of geometric thinking in young children.

These educators were concerned that students encountered difficulties in secondary-school geometry because had not developed a sufficiently high level of geometric thinking during their primary years. The van Hieles found that students progressed from “visual recognition of shapes by their appearances as a whole (level 0) to analysis and description of shapes in terms of their properties (level 1) to higher “theoretical” levels involving informal deduction (level 2), then formal deduction involving axioms and theorems (level 3), and finally work with abstract geometric systems (level 4) [12, page 205].” I used this proven, highly regarded research for guidance when I wrote the overview for the Geometry and Spatial Sense Standard for the *New Jersey Mathematics Framework* [10], and whenever I needed to judge a new textbook.

There is a tremendous amount of information available about teaching reading to young children, but a lot of the material is based more on opinion than on research. To provide some guidance for educators about the effectiveness of different approaches, the U.S. Department of Education sponsored an evaluation of phonics and reading programs. This study, which illuminated the role of phonics instruction, was conducted by psychologist Marilyn Jager Adams and is published as a book, *Beginning to Read* [7]. Adams evaluated over a hundred studies and found “with impressive consistency, that instructional approaches that include systematic phonics lead to higher achievement in both word recognition and spelling, at least in the early grades, and especially for slower or economically disadvantaged students.” Dr. Adams’ study also covers the research on skillful and poor readers. She reports that skillful readers effortlessly visually process each letter of a text, automatically translating spellings of words into pronunciations. Her study is a fantastic resource, read it before starting to judge programs for adoption. Some of the reading programs on the market are covered in the report.

The reading program we use for Kindergarten through grade two is *Open Court Reading*, a program that combines intensive, systematic phonics with reading literature. A recent update of this program was informed by the results of Dr. Adams’ research.

3 Milestones

In our charter we stated the need for students to “celebrate concrete accomplishment and mastery of appropriately defined objectives.” As we developed the curriculum we set up milestones of achievement to “punctuate a student’s progress in a highly visible way, and to give students and the rest of the PCS community an opportunity to celebrate academic achievement.” Milestones are significant learning objectives that the great majority of PCS students can achieve. They are more concrete than our overall objectives and each task has criteria that specify ‘how good is good enough.’ These milestone represent authentic, criterion referenced assessment matched to the school.

To create our milestones we considered our objectives for our graduates and identified major steps along the way. We planned for two or three milestones for each grade, one with a writing component, and one with a quantitative component. Over the years, every subject should be covered with increasing complexity, some milestones should integrate academic areas, some should concentrate in a single area, and none should rely on the parent’s facility with creating cardboard models.

The PCS milestones given in the next section illustrate these principles. For example, writing skill increases from

- a simple letter in grade two, to
- a story in grade three,
- a biography report in grade four,
- a compare-and-contrast essay in grade five,
- a short story in grade six,
- a literary analysis in grade seven, and
- culminates in a five-paragraph essay in grade eight.

Quantitative milestones increase from

- addition and subtraction facts in grade two, to
- multiplication tables in grade 3,
- tables and charts for a nutrition plan in grade four,
- a simple laboratory report in grade five,
- graphing running times in grade six,
- calculator proficiency in grade seven, and
- a quantitative science laboratory report in grade eight.

All subject areas are covered: English, mathematics, history, science, world languages, the arts, and health and physical education.

3.1 Student Achievement Milestones

3.1.1 Milestones: Grade One

Reading Milestone (English)

Task: Demonstrate ability to read a text at the level of a Dr. Seuss book.

Criteria: Able to sound out unknown words;

3.1.2 Milestones: Grade Two

Letter Writing Milestone (English)

Task: Write a letter to a family member about a day in school.

Criteria: Correct spelling, grammar, and punctuation; quality of descriptions and reactions concerning the day's events.

Addition Milestone (Mathematics)

Task: Show mastery of addition problems with sums less than ten and subtraction problems with differences less than ten.

Criteria: 100 percent accuracy on 30 problems each of addition and subtraction.

3.1.3 Milestones: Grade Three

Story Milestone (English, History, and Art)

Task: Write a story like the folk tales covered in history class, illustrate a cover page, and add from one to five illustrations. Read the story to the class.

Criteria: Use of five-step writing process; contains all elements of a story; no major mistakes in grammar, spelling, or penmanship; accurate historical references; illustrations relate to story.

Multiplication Table Milestone (Mathematics)

Task: Demonstrate mastery of multiplication tables.

Criteria: 90 percent Accuracy on 12-15 problems.

3.1.4 Milestones: Grade Four

Biography Report (The Arts and English)

Task: Students research an artist (painter or musician) and write a paper on the artist's life and works.

Criteria: Accuracy of information; complete bibliography; use of the five steps in the writing process; all grammar and spelling errors marked by teacher corrected.

Health and Nutrition Plan (Health, Science, and Mathematics)

Task: Prepare charts with baseline data on good nutritional and exercise practices, e.g., calories taken in and burned. Students plot their own exercise and diet practices for one week and prepare a written summary of results.

Criteria: Accuracy of baseline data and intelligibility of charts.

3.1.5 Milestones: Grade Five

World Civilizations Milestone (History and English)

Task: What is a civilization? Compare and contrast two civilizations that you studied and show how and why they are true civilizations.

Criteria: Quality of analysis; no errors of fact or of writing mechanics.

Science Laboratory/Safety Report Milestone (Science and Mathematics)

Task: Prepare a report of a science lab with arithmetic operations and data; explain all safety measures and the reasons for them; what could go wrong?

Criteria: Proper layout and writing; accuracy and explanations of safety measures and reasons for them.

Typing Milestone (Technology)

Task: Demonstrate competency in typing.

Criteria: Four lines at 25 words per minute; 90 percent accuracy.

3.1.6 Milestones: Grade Six

Short-Story Milestone (English)

Task: Write a short story from one of several assigned topics drawn from chess, music or sports.

Criteria: An outline and draft; quality of content and of writing; 750-1000 words.

Physical Fitness Milestone (Physical Education and Mathematics)

Task: Run a half-mile and record time; predict best time for one-quarter and one full mile, assuming a faster rate for shorter distances and gradual decline in speed over a full mile. Summarize total class results in a graph.

Criteria: Maximum time of 5 minutes; reasonableness of calculations; accuracy of graph.

3.1.7 Milestones: Grade Seven

Literary Analysis Milestone (English)

Task: Write a paper that demonstrates ability to analyze a selection drawn from literature.

Criteria: Identify theme, plot, setting, major characters, and so forth; good paragraph construction; proper use of language without grammatical or spelling errors.

Graphing Calculator Milestone (Mathematics)

Task: Use a graphing calculator to graph and compare linear and quadratic equations and absolute value functions; use the table, zoom, and trace functions; calculate nth roots and determinants of matrices.

Criteria: Thorough familiarity with calculator; accurate calculations; quality and accuracy of graph comparisons.

3.1.8 Milestones: Grade Eight

Essay Milestone (English and History)

Task: Write a five-paragraph essay on a conflict studied in the modern world history course. In drafting the paper, consider the political situation immediately prior to the conflict, the causes that led to it, the leading characters, their ideas and the roles they played, and the effects of the conflict in the countries involved.

Criteria: Accurate citations of sources; depth of comparisons, explanations, and judgments; quality of organization, syntax, and spelling; five-paragraph organization.

Science Laboratory Report Milestone (Science and Mathematics)

Task: The science teacher designates a school laboratory experiment that uses quantitative measurements to be written up for submission. Students write a draft report, followed by rewriting and expansion. The final report should be a polished version of the original draft, with clear explanations of the purpose of the experiment, procedures, equipment, observations, data analysis, and conclusions as well as possible sources of error.

Criteria: Correct format with conclusions supported by observations; neat layout and handwriting/typing; appropriate data analysis; proper use of language without errors in spelling or grammar.

French Language and Art (French and Art)

Task: Working together, two-three students prepare a paper on a work of art, including its subject, artist, style, and characteristics of the period. The students then present their paper, speaking only in French (2-3 minutes), and respond to questions (in French) from the judge(s) (1-2 minutes).

Criteria: Defensible judgments concerning the work of art; language fluency, accent, and vocabulary consistent with the number of years of study in French.

Spanish Language and Art (Spanish and Art)

Task: Choose a famous Spanish painting that includes several people. Describe in Spanish at least two people who are in the painting and their appearance and personal history or personality.

Criteria: Accuracy of description; correct vocabulary and grammar, consistent with one year's study of Spanish.

4 Creating the Curriculum: Starting from the Standards

Having defined our objectives, done our research, and established our milestones, we began to lay out the curriculum in detail. We started with the standards set out by New Jersey in the *NJCCCS* [3] and specified how our students in grades four and eight would meet each of the standards. We then established outcomes for each grade in each subject area. We found it convenient to organize outcomes into strands that aligned, for the most part, with the *NJCCCS*. Once we had a first draft of our outcomes, we looked for textbooks and other instructional materials that could be used in the classroom to achieve the desired outcomes. Using our objectives, outcomes, and the textbooks we selected, we wrote course descriptions for each grade and subject area. These describe the major goals of the course, the topics covered, and the instructional materials adopted. The writing strand for the English curriculum is used as an example to illustrate these steps below.

The curriculum development process was not, and is not, as smooth and straightforward as this description. Our complete curriculum has taken years to develop; some components were created in fits and starts, and some needed to be revised after assessments revealed weaknesses, or teachers found better approaches or instructional materials. Our staff continues to make minor adjustments based on their analyses of student learning, and their discovery of new books to use.

4.1 English Language and Literature

For our English Language and Literature curriculum, the strands we use are:

- Reading/Literature
- Writing and Penmanship/Composition
- Grammar/Syntax/Mechanics
- Spelling/Vocabulary
- Listening/Speech
- Research Skills (Library, Computer)

The New Jersey Language Arts Literacy Standard that address writing skills is:

Standard 3.3 *All students will compose texts that are diverse in content and form for different audiences and for real and varied purposes.*

The charter specifies how PCS will address this standard as follows:

PCS students write every day. Beginning with simple phrases and sentences, students gradually refine and expand their writing ability to include short writing assignments (journal entries, stories, letters) by grade 2 and the formal outlining-drafting-editing process to write and “publish” works that include smooth transitions by grade 4. Eighth graders show mastery of basic grammar, syntax, spelling, usage, and punctuation in their analytic and expressive writing and begin to develop a personal writing style. They also experiment with writing to create a given effect (e.g., to persuade, to instruct) and they cite sources as appropriate.

The original K-8 outcomes were drafted by a committee of three founders before the school opened its doors in September 1997. Their careful work has needed only minor adjustments over the years. The outcomes for the Writing and Penmanship/Composition are presented here for all the grades. The rest of the outcomes are available at our web site <http://www.pcs.k12.nj.us/program/program.html>

The given outcomes refer to an elementary mastery and assume further development in subsequent grades.

To become fluent writers, students should write every day. Complete sentences should be the expected written response to any question. By fourth grade, students should be writing at least a page (wide-ruled paper, every other line) in school or at home every day. Students should receive constructive, punctual feedback on their writings. From time to time, the teacher should heavily analyze a writing sample.

4.1.1 Writing, Penmanship, and Composition Outcomes

Kindergarten:

- practice elements (strokes) common to many letters starting at the correct point
- form (print) small and capital letters properly
- form numerals 0 through 9
- write own name

Grade One:

- record simple dictated sentences
- compose and print a story or description at least a half page (wide-ruled paper, every other line)

Grade Two:

- write assignments of at least one page, every other line (stories, diaries, letters, descriptions, book/film/theater reports)
- use both simple and compound sentences

Grade Three:

- use cursive
- write using varied sentence structure
- write a personal letter with paragraphing
- attempt to write poetry
- write a two page story, description, or report in one hour
- write assignments of two pages (double spaced) and edit to apply grammar, spelling, and enriched vocabulary to final draft

Grade Four:

- understand and use topic sentences
- produce outline for a simple essay (introduction, body, conclusion)
- write the essay using introduction, body, and conclusion
- write a story

Grade Five:

- write story containing dialogue
- write a short play
- produce simple comparison-contrast essay with outline
- write a five paragraph essay of literary analysis of a piece of fiction (short story) with an introduction, a conclusion, and an essay body discussing character, plot, and setting (continue and lengthen through eighth grade adding theme, imagery, style, point of view, mood, irony, foreshadowing, and flashback to analytical framework)

Grade Six:

- write editorial and news story

- write a short, simple research paper (in coordination with history)

Grade Seven:

- understand and use thesis statement
- use transitional sentences
- write a research paper of three to five pages (double-spaced) with some sources in the foreign language being studied

Grade Eight

- read and discuss Chapter V “An Approach to Style” in Strunk and White
- write compositions which include persuasion and build an argument
- write a four page essay, then double it or cut it in half
- write a short dialogue/play and “direct” it
- write a 10-page annotated research paper undergoing three drafts over twelve weeks

4.1.2 Course Description: English Language and Literature - Grade Eight

The goals of the English language and literature program for grade eight are that students be able to:

- enjoy reading a wide variety of literature;
- compose a well organized, grammatically correct five-paragraph essay; and
- speak confidently to their class about a topic.

Course Content

Literature and Reading Comprehension: Students read, discuss, and interpret novels, essays, narratives, short stories, poetry, and plays. Students identify themes, points of view, plots, settings, characters, moods, and the imagery of works. Reading selections serve as models of good writing and as subjects for a variety of writing assignments.

Expressive and Expository Writing: Students compose five-paragraph essays which are well organized, persuasive, and demonstrate command of grammar and compositional skills. Students practice writing in a variety of forms (essays, stories, poetry, letters, reviews, editorials, dialogues, and reports) and modes (narrative, analytical, expressive, and descriptive). Students apply their knowledge of grammar, spelling, and vocabulary to their writing in all subjects.

Grammar, Syntax, and Language Mechanics: Students diagram sentences; review parts of speech and sentence structure; recognize and use subjunctive voices; study restrictive and nonrestrictive clauses; and identify and begin to use ellipsis.

Vocabulary and Spelling: Vocabulary and spelling work use derivatives, word roots and etymology as tools. Students continue to work on building their vocabulary with particular attention to Greek and Latin roots.

Listening and Speaking Skills: Speaking exercises require students to memorize and recite selected poems. Students take notes during lectures and participate in class discussions. They make five-minute oral reports and field questions from their teacher and fellow students.

Research and Study Skills: Students use library and research skills when they write essays, editorials, and research papers.

Homework: Students have daily assignments amounting to 30 minutes per night in reading, writing, vocabulary, or grammar, as follow-up or preparation for each class period. Students are given frequent writing assignments for which they make notes and produce an outline, rough draft, revision, and edited version. They write essays, stories, book reviews, editorials, poetry, and reports.

Tests and Major Projects: Vocabulary, spelling, reading, or grammar quizzes will be given as needed, and there will be tests at the ends of units. There will also be reading and writing evaluations. Occasional major writing projects and research reports will be assigned.

Grading: Classwork, homework, quizzes, tests, participation in discussions, major projects, and presentations. Opportunities for revision of written work will be given.

Books:

Textbook: *Prentice Hall Literature: Silver*, Prentice Hall. A core anthology of short stories, nonfiction, drama, essays, poetry, folk tales, and a novel: *The Pearl*, by John Steinbeck.

Grammar: *Elements of Language*, John E. Warriner.

Vocabulary: *Vocabulary From Classical Roots C*, Norma Fifer and Nancy Flowers.

Literature:

Ender's Game, Orson Scott Card

To Kill a Mockingbird, Harper Lee

The Prince and the Pauper, Mark Twain

Old Man and the Sea, Ernest Hemingway

Julius Caesar, William Shakespeare

Biography of a world leader

Supplementary Literature

Little Women, Louisa May Alcott

Fahrenheit 451, Ray Bradbury

The Martian Chronicles, Ray Bradbury

Alice in Wonderland, Lewis Carroll

My Antonia, Willa Cather

The Red Badge of Courage, Stephen Crane

Robinson Crusoe, Daniel Defoe

The Three Musketeers, Alexandre Dumas

The Outsiders, S. E. Hinton

The Story of My Life, Helen Keller

Frankenstein, Mary Shelley

A Connecticut Yankee in King Arthur's Court, Mark Twain

The Time Machine, H. G. Wells

5 Assessment

Assessments are carried out by testing the students, but the results are used to assess the school and the effectiveness of its teaching and its curriculum. Our charter states that Assessment is an essential component of Princeton Charter School's education plan. Assessment confirms student progress, identifies areas of low and high achievement, and improves the accountability of the school. It begins with the teacher's evaluation of student progress based on written class work, oral contributions, and homework. Such evaluations are important, but may be insufficient to assess long-term subject mastery. Formal assessments, integrated with the curriculum, will indicate overall achievement levels.

Assessment results allow teachers to determine which students would benefit from additional help or additional challenge.

Generally, students in grades three through eight have unit tests as they complete a topic in a subject area. These tests allow both student and teacher to check on student progress at reasonable intervals. Students who are not performing well are identified and the teacher will spend extra time with them or arrange for them to have scheduled in-school tutoring from one of the other available faculty or tutors. The objective of the tutoring is to help the student keep up with the rest of the class. This intervention takes place promptly, before students fall so far behind that they are unable to catch up with their classmates.

At PCS, we have found that standardized tests are an effective way to analyze student progress from year-to-year, and to identify areas of particular strength or weakness in individuals, in groups of students, and in the curriculum itself. We use the Educational Record Bureau's Comprehensive Test of Basic Skills. (These tests are commonly called the ERBs.) We selected these tests for two reasons: their expectations of what students should know and be able to do are well matched with ours, and they offer an essay-writing assessment. As a school community we value and promote good writing skills, and having an external assessment of our student's writing is invaluable. In our first year of operation, the writing assessment results for all three grades, four through six, showed that the students were entering the school writing at the fourth-grade level. The averages were: Grade 4 - 3.75, Grade 5 - 4.28, Grade 6 - 4.15 (the averages represent grade levels). These results were dismaying and we hoped that our program would be effective in raising student writing skills. By the following year, the students had raised the class averages to Grade 5 - 5.28, Grade 6 - 6.63, and Grade 7 - 8.10, increases of 1.53, 2.35, and 3.95.

We give the ERBs in the fall, in late October or early November so that the results can be acted upon during the rest of the year. Teachers receive results for the students in their current class around the time of winter break; they have the rest of the year to address any problems they find. Most schools test in the spring, but by the time the results come back in the summer, neither the teachers nor the students are in school, and by the following year the teacher has a different class of students. We compare results of each group of students from one year to the next as they move through the school. Without such comparisons, there is almost no way of knowing if the school is making a difference. Having the results of this comparison in the middle of the year enables us to address any overall issues we identify by altering our course materials or teaching emphasis. For example, when we compared the testing we did at the beginning of our second year with the results from the first year, we found that the seventh-grade results showed more than a year's gain in one year's time, except in vocabulary. The students in grade seven gained slightly less than a full year's growth in vocabulary since they were tested the year before. Reading vocabulary-rich literature was not enough; our students needed something more. To address this weakness we added vocabulary books that concentrated on words derived from Greek and Latin roots. Students learned to look for roots and related words when they encountered an unfamiliar word, and their vocabularies improved.

We analyze our students' performance by splitting them into three groups: the top group are those that perform at least as well as the top-performing 23% (called the top quartile by testing experts) of students in suburban schools nationwide; the bottom group is comprised of students whose scores are comparable to the lowest-scoring 23% of suburban students, and the middle is the rest. In 1997, 43% of the students in grade six scored in the top quartile, and only 13% scored in the bottom quartile on the vocabulary section. However, in 1998 when these students were tested as seventh graders, 32% of the students scored in the top quartile and 37% in the bottom. By 1999, after a year of more etymological vocabulary development, the students, now in grade eight, had scores that placed 45% in the highest quartile and only 15% in the lowest quartile.

References

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