

## Partnerships for Progress in Inner City Schools

Over the past few years, a number of businesses in Cleveland, Ohio, have formed educational partnerships with high schools in the inner city. The objective of these Partnerships for Progress is to help secondary school students complete their education and be better prepared for future employment. The degree of involvement by businesses in this program ranges from tutoring and promoting better attendance to becoming closely involved in the school's activities.

In its own Partnership for Progress, the NASA Lewis Research Center is teamed with East Technical High School, a public high school located in a high-poverty area of central Cleveland. Students come both from the surrounding area, and by school bus from other parts of the city. At East Tech, Lewis is involved in a wide range of programs that emphasize science and engineering and include tutoring, mentoring, "shadowing," summer jobs for students and faculty, funds for specialized equipment, and science fairs. In addition, being a large, diverse organization, we can involve students and faculty in a wide range of functions outside of science and engineering. In the interest of promoting school-wide cooperation, students and teachers have been included in educational activities in the areas of food service, publishing, editing and art work, library operations, and administration and purchasing.

This article will concentrate on a "thematic" program we are developing in engineering and the physical sciences. Since East Tech is a comprehensive high school, as opposed to a magnet school where the entire curriculum is devoted to a single educational role, a thematic program is a special function within the school's general curriculum. Participation in the thematic program requires higher academic achievement or other indicators of ability.

The objective of the Engineering/Science Program, as designed by faculty and NASA advisers, is twofold. First, it is to provide a superior technical education appropriate for college Advanced Placement (AP) credit; it also aims to include special enrichment activities that go beyond standard AP programs, activities that an organization such as NASA can provide. Second, the program attempts to provide some employment-oriented skills to students who, although bright, may be limited in opportunities because they come from underprivileged backgrounds. As such, the program was designed with

both an academic-track engineering/science component and a technician-track for students whose ultimate educational objective may be an associate degree from a junior college. The program starts in the ninth grade, but is designed to enable switching in either direction through the end of the tenth grade. In addition, the technician track has been designed so that participating students will have the necessary requirements for a four-year college program, should they later decide to further their education.

The engineering/science component has the standard AP course content, but also contains some specialized courses such as Engineering and Science Careers, in which NASA personnel in various disciplines team-teach courses in their particular fields. This gives the students direct experience with working professionals. If a student expresses interest in a particular field, the program provides the opportunity for spending time with the engineer on-site ("shadowing"), enabling the student to observe professionals in their "natural habitat." Also, when a definite interest is established, a mentoring relationship is set up with the engineer, scientist, or technician.

A new component of the curriculum, being initiated this school year, is a research project whose objective is to involve the school in some part of a program at Lewis which can be handled by high school students. This research project consists of team projects involving both the technician track and the academic students, in their relative roles. We hope that the studies will result in a report, peer-reviewed by the students, as guided by the mentors, that will appear in a special NASA publication. This publication should serve to give students a sense of pride and to aid them in their

The Education Exchange highlights the experiences of scientists and engineers with local schools, along with helpful hints and resources. If you would like to share your own involvement in science education, contact: Finley Shapiro, Department of Electrical and Computer Engineering, Drexel University, Philadelphia, PA 19104, U.S.A. Phone (215) 895-6749; fax (215) 895-1695; e-mail: shapiro@ece.drexel.edu

academic and employment pursuits. This project will be linked to a technical writing course that will teach work-related writing skills necessary for composing business letters, purchase requests, and proposals.

Visits to the NASA library and training in computerized literature searches are also part of the process. The students aren't expected to be able to understand the technical literature, but this special training exposes them to resources many people don't discover until graduate school. In addition, we intend to include other departments at the school in the collaboration. For example, we hope that students will work with the East Tech art department on drawings for their project reports.

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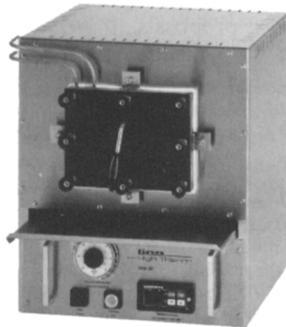
The thematic Engineering/Science program aims to provide enriched advanced placement studies and also employment-oriented skills.

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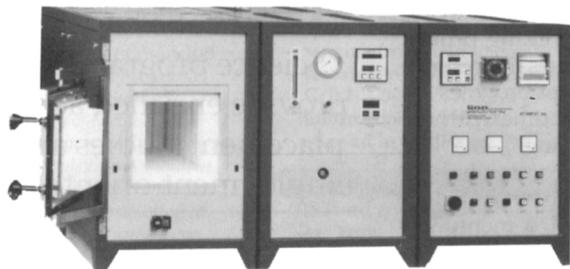
The technician part of the curriculum places special emphasis on providing employable skills that would enable students to find employment after graduation. For example, the students' computer-assisted design (CAD) software and work stations will be the same as those used in the engineering design department at Lewis; in addition, some of the work in this department will be farmed out to those students who have a design engineer as a mentor. This CAD training will enable students to move into what, in private industry, used to be called a drafting job. They will have not only work-related experience from NASA drafting projects, but also training with the software and hardware currently used. We hope that both the training and the work experience will be sufficient to attract a prospective employer. The academic-track students are also required to take an elective in the technician program.

We are now in our second year of offering the thematic Engineering/Science Program; at this point we don't know how this ambitious program will develop. There have been and still are obstacles to overcome. For example, we have experienced some problems with East Tech's obviously bright students relative to their level of preparation for the program.

# German Furnace Technology



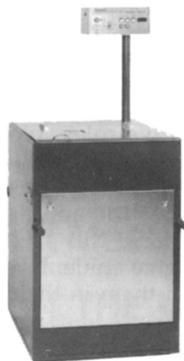
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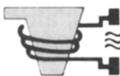
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State-mandated curriculum requirements have made it difficult for the school to include everything we would like. Moreover, some school and NASA administrators who don't possess the total commitment needed for such a program have placed road-blocks in our path to progress. Nevertheless, the faculty members in this economically deprived school have always been inspiring in their dedication, and outstanding in their cooperative attitude toward the NASA employees.

Some components of our work with East Tech, such as tutoring and helping with science fairs, have been in place for several years. The school's new, dynamic principal, through energy and dedication, has greatly smoothed the initiation of the curriculum, and a full-time administrator to the program, recently appointed by NASA, has greatly facilitated the working relationship. School busing makes the program available to students living in any part of the city. This creative partnership now has considerable hope for success and could serve as a model for other school-business relationships.

JOHN FERRANTE AND JONATHAN E. BOYD

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