

**SUMMER SCIENCE  
CAMP and FOLLOW-UP  
PROGRAM  
(Math/Science Institute)  
1996-97  
PROGRAM EVALUATION  
REPORT**

**FUNDED BY:  
US DEPARTMENT OF ENERGY  
THE CITY COLLEGE OF NEW YORK  
NEW YORK CITY BOARD OF EDUCATION**

**MASTER**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

ph

### DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

## **DISCLAIMER**

**Portions of this document may be illegible electronic image products. Images are produced from the best available original document.**

## **1. Summary**

The 1996-7 Summer Science Camp and Follow-up Program provided 307 students and 45 mentors with enrichment and problem-solving opportunities in mathematics, science and humanities and encouraged these students to consider careers in professions related to these areas. Students entering the 7th grade participated in classroom studies, laboratory experiences, field trips, tutoring/mentoring, and dialogue with leading educators, scientists, mathematicians, chess masters, and practitioners. The Summer Science Camp is conducted at Stuyvesant High School and the Pocono Environmental Education Center where students are taught by teachers experienced with high school curricula. In addition current students from the three New York City specialized science high schools (Stuyvesant H.S., Bronx H.S. of Science, Brooklyn Technical H.S.) served as role models, mentors and tutors. The follow-up program is conducted from September to June and continues the summer curriculum.

The Summer Science Camp objective is to interest more students from under-represented groups in the three New York City specialized science high schools, in applying and preparing to be accepted and excel after admission to these schools. (182 students, 59%, from the 1996 SSC passed the specialized science high school entrance examination.) This objective is achieved by:

- improving the student's proficiency in science, math and verbal understanding.
- preparing students to take challenging enriching courses in math, science and humanities.
- developing students test-taking and problem-solving skills.
- changing the student's attitude toward science and mathematics subjects.
- expanding the pool of participants pursuing careers in science, math and technology.
- exposing students to new career opportunities in science, mathematics and technology.
- increasing collaboration among The City College and New York City Public Schools.

## **2. Cooperative Relationships**

The City College of New York, working in close cooperation with the New York City Public Schools, High School Division, developed and implemented the 1994-7 Summer Science Camp and follow-up programs. The resources and funding of the New York City Public Schools and funding from the US Department of Energy made this program possible.

## **3. Program Design**

Participants in the summer program met in a structured high school and summer camp setting. They participated in challenging and exciting classes, multicultural programs, science projects and special activities designed to acquire knowledge not ordinarily imparted in a traditional educational experience. Participants select formal classes and a variety of elective activities. Classes included: math and verbal skill building, literature, mathematics problem solving/games, computers, creative writing with cultural emphasis, laboratory techniques, study of the built environment (architecture), sketch drawing, multicultural history, science research and chess. The program comprised three interrelated academic approaches: lectures, laboratory work and enrichment. These approaches were designed to encourage maximum participation in a program, the objectives of which were the acquisition of specific knowledge, skills and social values in an environment that was intellectually stimulating and culturally enriching. The follow-up program continues the summer activities.

## **4. Student Selection (1995-6)**

Student recruitment was coordinated by the New York City Public Schools, High School Division and the Math/Science Institute staff. The students are upcoming 8th graders from the public middle and junior high schools. A special effort was made to recruit students from districts and schools not typically sending students to the three specialized high schools. Students were selected by their local school district based on their chances for success in the program. The Institute staff then reviewed the selected students; 650 (1995-6) candidates were reviewed. Of the candidates reviewed, 350 were selected, 307 completed the 1996 summer component and follow-up program. Table 1 presents the number of students by borough of residence, Table 2 presents public school students participation by school district, Table 3 presents private/parochial school students

participation by borough, Table 4 presents student participation by gender and ethnic background and Table 5 presents student passing specialized high school entrance examination.

Table 1.  
Student Participation by Borough of Residence

<b>Borough</b>	<b># of Students</b>
Bronx	41
Brooklyn	147
Manhattan	44
Queens	70
Staten Island	5
<b>Total</b>	<b>307</b>

Table 2  
Student Participants by Local School District  
(Public School Only)

<b>District</b>	<b># of Students</b>	<b>District</b>	<b># of Student</b>
one	7	seventeen	8
two	9	eighteen	14
three	5	nineteen	7
four	4	twenty	8
five	12	twenty-one	7
six	5	twenty-two	16
seven	6	twenty-three	6
eight	3	twenty-four	2
nine	5	twenty-five	5
ten	4	twenty-six	3
eleven	8	twenty-seven	7
twelve	11	twenty-eight	6
thirteen	17	twenty-nine	16
fourteen	9	thirty	3
fifteen	5	thirty-one	3
sixteen	24	thirty-two	14
		thirty-three	2

Table 3  
Student Participants by Borough  
(Private/Parochial Schools)

<b>Borough</b>	<b># of Students</b>
Bronx	4
Brooklyn	11
Manhattan	6
Queens	23
Staten Island	2

Table 4  
Student Participation by Gender and Ethnic Background

<b>Gender</b>	<b>Ethnic Background (#)</b>			
	<b>Black</b>	<b>Latino</b>	<b>Asian</b>	<b>Other</b>
Female (178)	103	40	24	11
Male (129)	65	27	21	16

**Table 5**  
**Student Passing Specialized High School Entrance Examination**  
**by School, Gender and Ethnic Background**

Gender	Ethnic Background (#)							
	Black		Latino		Asian		Other	
	M	F	M	F	M	F	M	F
Stuyvesant (34)	3	4	4	3	3	7	6	4
Bronx HS (64)	12	21	7	5	6	6	4	3
Bklyn Tech (83)	16	27	6	12	7	7	5	3

In general, the students were enthusiastic and of average to above-average academic achievement. All the students were deemed to have the potential for success in the program.

### 5. Length of Program

The summer component had a total duration of six weeks. This included five weeks at Stuyvesant High School and one week at Pocono Environmental Education Center. The follow-up component is two days per week, September through June.

### 6. Summer Program

a. *Mentoring/Tutoring* - Students from the three specialized science high schools served as mentors and tutors in the program. The mentors were assigned students to tutor in mathematics, science and verbal skills and to work with the same students on their enrichment class assignments. The program counselors are NYC Board of Education certified teachers.

b. *Classroom Activities* - Lectures focused on nontraditional and traditional curricula to facilitate learning and to enhance student skills, including: problem solving, research methodology, writing and verbal. Special sessions prepared participants science competitions and chess other competitions. In the science laboratory, teachers worked with students one-on-one which permitted participants the opportunity to explore and resolve their individual intellectual interests. The participants experienced enrichment activities in areas reflecting their particular interests in science, mathematics and creative writing. Participants attended seminars and lectures presented by university faculty, special guests (including chess master) and practitioners.

c. *Nonclassroom Activities* - Students were given a chance to enjoy cultural exchanges with students from different backgrounds and to discuss various career opportunities. Students were offered recreational sports in soccer, volleyball and swimming and participated informally in basketball. The program offered a healthy coed environment, with carefully structured and supervised programs, including dances, social evenings, music, special cultural events and more. Special activity classes took advantage of the unique knowledge and experience of the faculty. The academic faculty were available to answer students' questions. The faculty, staff and mentors were experienced in teaching under-represented groups; they were enthusiastic, energetic and related well to younger students. The faculty, guest lecturers, staff and mentors included African-American, Latino and Asian male and female role models.

d. *Research program* - A special project that were a highlight of the summer program was the research projects. Students, working in small groups, collaborated on the projects and then designed a display illustrating the results of their work.

### 7. Follow-up Program

The follow-up program continues the summer curriculum as well as a comprehensive review of math and verbal skills as well as instruction in test-taking techniques. The program consisted of classes, workshops, diagnostic testing and homework. Classes are the core of the program. Students attended classes two days per week, (Saturday and Wednesday), September through June. Each class had a duration of one hour. Students were grouped by shared strengths and weaknesses based on a diagnostic test and their was never more than twenty students per instructor.

## 8. Evaluation And Recommendations

### a. Student Outcomes

1. *Data* was compiled for all participants using subject based tests, guidance survey and a survey of attitudes towards science, mathematics and the three specialized science high schools. Teacher and student interviews and formal discussions also gave insight into growth in positive attitudes and perceptions toward learning and higher level of confidence.
2. *Exit Examinations* - tests were given by the academic area faculty at the conclusion of the course in each separate unit of instruction. The tests covered the range of course content. The results of the exit tests showed an impressive mastery of the concepts and information presented.
3. *Math and Verbal Skills* - pre and post tests were conducted using The New York City Board of Education diagnostic tests. To the extent that comparability of these tests permit, students showed improvement in their test-taking ability and in their mathematics and verbal skills. It was felt that the length of the program permitted adequate time for verbal improvement.
4. *Student Attitudes* - using the Learning Skills Attitudes Questionnaire (developed by the New York City Board of Education, Office of Research, Evaluation and Assessment and the program staff) students were asked to indicate their attitude toward learning and their perception of their ability to gain admission into a specialized high school. A pre and post analysis of the questionnaire showed a strong increase in positive attitude toward their own ability to learn to do mathematics and science and to get into a New York City specialized science high school.
5. *Student Comments* - a survey was conducted of each student. Students were asked about their current school experiences and future plans. They were also asked about their feelings concerning the summer program. The students indicated that the program was an outstanding learning experience and they were looking forward to the opportunity of attending one of the three specialized science high schools.
6. *Faculty Perceptions* - the Institute's highly structured program and schedule served to enhance the students' learning experience. The faculty noted changes in student perceptions. The students appeared to have a greater sense of worth and a higher self-confidence level. All students felt that because of the Institute they had a higher level of knowledge in mathematics, science and verbal skills. The faculty also felt that the students were better prepared to handle the challenges ahead. The students were appreciative of the opportunity afforded them. The students also exhibited a serious attitude toward the program. This was exhibited by excellent program attendance and student participation.
7. *Guidance* - Guidance counselors were included in the program staff. These counselors proved to be highly effective providing counseling services to program participants and support to staff and parents.

### b. Parental Involvement

The parents took an active role in the program from the pre-program orientation through the graduation ceremony. Special events were conducted for parents, including parents day and other special activities. The level of parent participation was approximately 95 percent. It is still recommended that the parents become involved in the program preplanning and that alumni parents provide advice on future activities. This participation would be accomplished through parent workshops. To keep alumni students and parents informed of future activities, it is recommended that a newsletter be established.

### c. General Program Outcomes

The Summer Science Camp and Follow-up program is a positive experience for the youngsters involved. The evaluation indicates that students benefited from this focused academic and social enrichment program and with additional support will be better able to achieve at higher levels.