AIIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

301/587-8202

Centimeter

Inches

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

1 of 1

DOE/SR/18048-2

STUDENT SCIENCE ENRICHMENT TRAINING PROGRAM

PROJECT REPORT

SUBMITTED

TO

U.S. DEPARTMENT OF ENERGY
SAVANNAH RIVER OPERATION OFFICE

HBCU PROGRAM MANAGER
P.O. BOX A
Aiken, South Carolina 29802
(803) 725-8104

By

Shingara S. Sandhu, Director
Division of Natural Science and Mathematics
and Computer Science
Claflin College
Orangeburg, South Carolina 29115
(803) 535-5244

PROJECT REPORT
SUMMARY

TITLE: Student Science Enrichment Training Program

Funds were requested for a Student Science Enrichment Training Program, with special emphasis on chemical and computer science fields. The residential summer session was held at the campus of Claflin College, Orangeburg, SC, for six weeks during 1993 summer, to run concomitantly with the college's summer school. Fifty participants were selected for this program which included high school sophomores, juniors and seniors. The students came from rural South Carolina and adjoining states which, presently, have limited science and computer science facilities. The program focused on high ability minority students, with high potential for science engineering and mathematical careers.

The major objective was to increase the pool of well-qualified college entering minority students who would elect to go into science, engineering and mathematical careers. The Division of Natural Sciences and Mathematics and engineering at Claflin College received major benefits from this program as it helped us to expand the Departments of Chemistry, Engineering, Mathematics and Computer Science as a result of additional enrollment. It also established an expanded pool of well qualifed minority science and mathematics graduates, which were recruited by the federal agencies and private corporations, visiting Claflin College Campus. Department of Energy's relationship with Claflin College increased the public awareness of energy related job opportunities in the public and private sectors.

The major objectives of these programs were to develop and foster knowledge, understanding and interest in physical, computer, engineering and mathematical sciences. The program placed emphasis upon laboratory experience, visual hands on work and some research participation. Visits to

Scientific Laboratories and other points of scientific interests were arranged to stimulate scientific career goals among the participants. Several guest speakers from DOE, industry and academic institutions participated in the program. They talked about the careers in science, engineering and mathematics and also acted as role models for the participants.

STUDENT SCIENCE ENRICHMENT TRAINING PROGRAM PROGRESS REPORT

I. Introduction

Claflin College, a predominantly black undergraduate institution located in Orangeburg, South Carolina, has served the needs of rural communities for more than one hundred twenty-five years. Claflin offers liberal arts and teacher preparation programs, and is fully accredited by the Southern Association of Colleges and Secondary Schools.

The FTE (Full Time Enrollment) student enrollment during the first semester of 1993-94 was 956. According to the information obtained from the Office of Financial Aid, approximately 95 percent of the students received financial aid; on the average, a student was on 80 percent financial aid.

The church-related (United Methodist) school has experienced a significant expansion of its facilities in recent years. The Division of Natural Science and Mathematics is located in the James S. Thomas (JST) Science Center which was dedicated in 1976. It is a multimillion dollar modern building with good equipment and facilities.

The Division of Natural Sciences and Mathematics is composed of three departments: The Department of Biology, the Department of Chemistry, and the Department of Mathematics and Computer Science. The Department of Biology, Chemistry and Mathematics and Computer Science offer major and minor programs. The Division also offers a pre-medical curriculum and a chemistry academic program with concentration in Environmental Chemistry. In addition to offering a major in mathematics, computer science, a composite major in mathematics and computer and a major in information management, the Department of Mathematics and Computer Science offers minor in Computer Science, Mathematics, and Physics. The Division offers B.S. Engineering Techology degree in cooperation with South Carolian State University.

II. Target Schools and Students

As is shown in Table I* there is a progressive decline in the Science and Engineering Professions, chosen by the freshmen, entering colleges and universities. This is a nationwide trend and is not unique to Claflin College.

Table I,* Trends in science majors chosen by freshmen, nationwide

PERCENTAGE OF ALL FRESHMEN

	1977	1985
Biological Sciences	4.7	3.4
Physical Sciences	3.1	2.4

	1983	1984
Computer Science	8.8	6.1

	1982	1985
Engineering	12.0	10.0

Source NSF Publication NSB-86-100

Among students who complete degree programs in Sciences and Engineering, about one-half (1/2) of the B.S. recipients, two-thirds (2/3) of M.S. recipients and three-fourths (3/4) of Ph.D. recipients actually entered the science work force. The experts are already guessing, that by mid-ninities, there will be approximately half a million more jobs than US born and US educated workers available for the new openings. They are also guessing, that blacks will continue to lose ground and the government will have to allow more immigrants in to make up the difference. This is already happening and there is a huge flex of well educated immigrants. If the present pattern of field selection continues and if employer demand does not abate, it is clear that the nation will face serious manpower supply shortage in technical fields over the next ten years.

Blacks and other minorities (Hispanics, American Indians) have a dismissal record when it comes to their freshmen year. Blacks form about 10% of the nation's workforce. However, they form only 2.9 (up from 2.7%) percent of the national professional manpower. One thousand blacks recieved Ph.D. degrees in 1985, out of which, only 30 Ph.D. degrees were awarded in Science, Mathematics and Engineering. Majority of 30 doctorate receipients were in the field of Biology and Health. In South Carolina, minorities constitute 31.7 percent of the state population, but they form only 15.24 percent of the professional work force. The role of minorities in Science and Technology is very disappointing. A state, possibly, can not move speedily towards the new scientific horizons if a majority of its citizenry is incompetent to participate in the logic of decision making process relating to Science and Technology.

Today, black and other minorities constitute about twenty percent of the public high school's student bodies and by 2010, the minorities will form over one-third of the total work force. By 2020 one working person will support one retiree. One can go on quoting statistics to prove that the minorities are woefully under represented in the Science and Technology work force and a serious need exists to enhance their participation in these professions.

The Federal Government and several national companies have fully realized that there is going to be an acute shortage of technical manpower in the near future, consequently they have decided to exert their influence in increasing the role of minorities in the field of Science, Engineering and Mathematics. Historically Black Colleges and Universities wing of the Department of Energy at the Savannah River Operation Office was able to commit funds for the residential 1988 Summer, "Student Science Enrichment Training Program" which was held at the campus of Claflin College, Orangeburg, SC.

PROJECT PROGRESS

This project accepted fifity predominantly minority (Afro-American) students. All of these students were high school juniors and seniors from rural South Carolina high schools, with limited science education programs and came from small or medium sized towns in South Carolina and adjoining states.

This was a residential project. It was very helpful that the housing aid was given to the participants in this project, as the participants were recruited from rural areas where family incomes are very low and without room and board it would have been impossible to reach this group. Indeed, in the small and medium sized towns of South Carolina, making up for the loss of a student's summer earnings is a significant contribution by a family. It was a wise decision that the participants were compensated for room and board while they were on campus, enrolled in the summer project.

III. Major Objectives of the Project

In many of the rural high schools in South Carolina the science and computer educational opportunities are limited to simple classroom discussions with little in-depth exploration of subject matter.

Students from such schools graduate with preconceived notion about the difficult task of succeeding in science professions. In particular, the opportunities for laboratory experiences are non-existent in such schools. In recognition of the deficiencies in scientific knowledge and techniques, the following goals were adopted and achieved by funding from DOE:

A. Increased the pool of well-qualified college-entering minority students who selected to major in Physical and Engineering Sciences.

B. Developed and foster knowledge, understanding, and interest in science.

C. Offered Chemistry program which placed emphasis upon laboratory experiences and some research participation.

D. Developed in participants, the belief that the Science careers are exciting, challenging, and can be successfully pursued by them.

E. Arranged visits to scientific laboratories and other points of scientific interests for motivational purposes and to generate scientific curiousity.

F. Assisted participants in making career choices by introducing them to a variety of information and experiences, including interaction with scientists, guest speakers and role models.

G. Motivated participants to go back to their high schools and to work hard to prepare themselves so that they would be able to pursue science careers in college.

H. Encourageed and motivated participants to take national college entrance (SAT etc.) tests and had the appropiate college faculty to guide the participant in that direction.

IV. Project Description

The project for Student Science Enrichment Training Program (SSETP) was planned for minorities and disadvantage students who were (1) Rising Juniors (2) Rising Seniors and (3) Freshmen Class at Claflin College (1992-1993 Freshmen Class). The brochure was printed (see Enclosure 1). A list of all high schools, located in the State of South Carolina, was procured from the Office of the Admissions and Records. Five copies of the brochure which also included application blanks, was mailed to the chairman, Department of Science of each high school in the state. Information was also advertised in all major daily news papers of South Carolina. The students identified by their teachers or guidance counselors or academic advisors, as capable of pursuing careers in Physcial Sciences and Engineering were encouraged to apply for SSETP.

In response to our approach, the project received 135 applications which were placed into following catagories (a) applicants who expressed interest in choosing Claflin College for their undergraduate studies; (b) applicants who were ready to go into Science careers, but their choice of undergraduate studies was not Claflin; (c) the applicants who were not interested in science careers. The

applicants in this catogory (c) were not considered for acceptance into SSETP. The project director interviewed, by telephone each of the remaining applicants to determine the firmness of their interest in Science, Engineering and Mathematics. The applicants in the categories A and B were separetely graded based on the telephone interviews and their academic performance. Applicants out of these two categories were selected. All the selected applicants were informed through a letter. They were asked either to accept the offer by checking "Yes" or refuse the offer by checking "No" . Three applicants out of fifty checked (No) and several of them did not care to respond. Consequently a subsidiary list of applicants (waiting list) was produced immideately. The applicants in this group were made the similar offer as mentioned above. By June 8, 1993 we had fifity applicants who committed to join the program for 1993 Summer. The list of the students0 who participated in the program is enclosed (enclosure II).

The students were housed in the college dormitories. The female students, numbering twice than the male participants, were accomodated in Asbury Hall, two per room on the ground floor. The male students were accomodated in High Rise dorm, three to a room. The project director and some other SSETP staff members were in the dorms to facilitate their moving into the assigned spaces. On their arrival the participants and their parents went through the process of orientation.

The Student Science Enrichment Training Program (SSETP) ran concurrently with the college's summer school of 1993. The SSETP commenced on June 8 and ended on July 18, 1993. The students reported to the Science building on the morning of June 8, 1993. The participants were enrolled in Chemistry 121 (Gen. Chem) and Computer Science 200 (Computer concepts) for a total of 7 Semester Hours (SH). They were divided into two groups of 25 each. Consequently, there were two sections (A&B) for Chem 121 and two sections for Computer Science course. One group of twenty-five students took Computer Science and the other took Chemistry. The group rotated with each other so that

each student was exposed to chemistry and computer operations and its applications in solving chemical problems. Chemistry academic programs, assisted by computer simulations and computer assisted instructions (CIA) to make learning of chemistry fun, were offered during six weeks of the program. Each student was aided to learn adequate fundamentals of computer handling and operations which were applied to the learning of Chemistry and en-hancement of computer expertise.

The students were involved in classroom instructions, laboratory activities and research. It was conceived that student's involvement in research and science projects stimulated the high ability students to continue their education and plan for careers in Science and Engineering. Each student was encouraged to select a topic in the fields of Science or Computer Science which involved one of the followings:

A. Laboratory research work; requiring skills to use simple scientific tools and chemicals under laboratory conditions

B. Literature research on any of the modern topics of scientific interest such as laser and fusion, Super conductivity, threat of aid etc.

C. Science equipment fabriation which can demonstrate Science Technology applications.

D. Computer simulation/software modifications etc.

This idea of student's involvement in research was a great success. Every student prepared material (see enclosure III) of his or her choice and presented it to the audiance which included students and faculty. These seminars were jointly chaired by a student and a faculty member. The student chairperson was given the responsibility to introduce the speaker who provided biographic material to the student chairperson. The good presentations were slected by the panel consisting of SSETP staff and faculty. The awardees and their topics are given below.

Name	Topic Field
First Place in Science	
Lola Kelly	"What Are the Effects of Bleach on the Color Stage of Hair"
Second Place in Science	
Carl Lebby	"Will the Difference Between Sodium Hydroxide and Potassium Hydroxide Chahge the Effectivencss of Soap"
Third Place in Science	
Patris Toney	"Optical Illusions"
First Place in Computer Science	
Selena Walker	"Integrated Computer Systems Vs. Individual Computer Systems"
Second Place in Computer Science	
Frederick Love	"The Computer Virus"
Consolation in Science	
Octavia Smalls	"Air and Water Pollutions"
Marcus Washington	"Lasers"
Consolation in Computer Science	
Pamela Summers	"WordPerfect: The Perfect Way to Organize Documents"

The caliber of material and its presentation were excellent considering the academic background of each participant. Each winner listed above was awarded an achievement certificate (see enclosure IV) and a cashier's check of $30.00 for first place, $25.00 for second place, $20.00 for the third and $15.00 for the honorable place. These awards and certificates were awarded by Ms. Marlenia Murry, and Miss Rita Freeman of DOE from SRS. (see enclosure V) . The parents of the participants as well as the graduates of 1992 & 1991 SSETP were invited for the banquet. The closing banquet was taped. The video tape is available in the Office of the Director. Dr. Douglas Johnson, Vice President of Academic Affairs high-lighted the occasion by his humerous talk which brought out the role of minority scientists in keeping America ahead of competition . Each participant received a certificate for having successfully completed the SSETP (see enclosure VI). Additionally each particpant received 7 Semeter Hours of academic credit 4, SH in Chemistry and 3 SH in Computer Science - which is transferable to an undergraduate institution of their choice. Over 85 percent of participants received passing grades.

Instruction on the use of the library, correction of fundamental deficiencies in Mathematics and Science, discussion on career in Science, and the preparation and presentation of papers on the research projects were integral part of this project.

Provision was made for tutoring by undergraduate Chemistry and Computer Science student assistants, in supervised study sessions, and for generous time allotment to teachers for office conferences with students. Supervised study sessions were scheduled for the afternoon hours. Miss Monica Lyles, a Junior Chemistry Major and Mr. Darrin Smith, a Computer Science Major were employed as laboratory assistants. They performed tutorial services mentoring and were constant companions of the SSETP particpants.

An interesting component of this program was to train the participants in taking SAT. The participants were given a pre-test in SAT and then were guided by an english instructor and a math instructure. At the end of the program the participants were given a post test. I am very pround to mention that average SAT score increased by about sixt (60) points which can make a difference in getting into a college or getting into a good college.

V. Guest Speaker

Several activities such as project meetings, sessions with the guest speakers, presentation of science application videos and sound filmstrips were scheduled in the afternoon. The guest speakers were drawn from a spectrum of persons, with good scientific as well as community service backgrounds. The speakers who participated in this program represented academia, Claflin College; South Carolina State University; Medical University of South Carolina; Industry-Ethyl Chemical Corporation; Dupont; Business World and Governmental agencies-Department of Energy. The speakers acted as role models and assisted the participants to examine career choices in Physical Science, Computer Science, Mathematics and Engineering. Selected sound strips and videos which contributed to student's knowledge, procured from American Chemical Society and National Science Foundation, were screened from time to time. Each such presentation was followed by open discussion in which participants as well as guest speakers took an active part. The guest speaker donated their time and energy free as a service to the community. The names of the speakers, their affiliation along with their topics are given below.

1. Dr. Oscar Rogers, Jr. Ed.D — "Life Experience"
   President, Claflin College

2. Bert Knessel, Ph.D — "Chemistry and You"
   Organic Chemist
   Ethyl Chemical Corporation
   Orangeburg, S.C. 29115

3.	Dr. Roy Isabel, Director Research South Carolina State University	"Role of Research in Science Education"
4.	Vernon Middleton, Vice President Alumini Affairs Claflin College	"Role of Claflin in our Community"
5.	Henry Harris, Coordinator HBCUs Savannah River Site Aiken, SC	"Role of Minority in Science and Engineering"
6.	Carl Clark, Physicist College of Science South Carolina State Univeristy Orangeburg, S.C.	"Super Conductivity"
7.	George Lee, Director Admissions and Records Claflin College	"Claflin is Good for You?"
8.	Earl Middleton Claflin Aluminus Owner Operator Coldwell Banker Real Estate Orangeburg, S.C.	" I made it, Can You"
9.	Barney Jackson, M.D. Claflin Aluminus High Point North Carolina	"How to Prepare to Get into Medical School"
10.	Mr. Budy Clark Manager Public Relations Dupont Camden, SC	"More Scientists are Needed"
11.	M. Nathaniel Edward Claflin Aluminus Dupont Camden,SC	"Minority Scientist and Engineers"
12.	Robert Sablis, Ph.D. Director of Admission USC Medical School	"USC Efforts to Enroll Minorities"

VI. Industrial/ Academic Visits

To expose the students to science outside the program and to familiarize them with research tools in science, students were taken to a day-long field trips to scientific laboratories located at places such as the Savannah River Site (D.O.E. facility in Aiken) and the Medical University of South Carolina, Wesvaco Paper and Pulp Plant and Dupont Fiber Plant, Charleston, Huge, Orangeburg, Water Treatment and Sewage Facilities, Orangeburg.

To further expose the students to different scientific settings and provide appropriate role models, a series of science laboratory visitations and field trips were planned. For example, students visited the University of South Carolina, Columbia, which has regional Nuclear Magnetic Resonance (NMR) facilities and recently completed an engineering center. At SRS, students also visited laboratory facilities where research relating to the handling and disposal of radio active waste material is being conducted (DWTF). The students also visited robots research center at SRS. A number of get together opportunities were made available to the students through picnics and formal dinners. Summer program for participating students was conducted in such a way that students left the campus, at the close of the semester, thinking that Science is fun and a rewarding field to get into. The places visited by participants along their importance are given below:

Place	Importance
1. Ethyl Chemical Speciality Chemicals Orangeburg, S.C.	Iboprofin, Alkyl Aluminum and and several pesticide intermediates
2. Carolina Eastman Columbia/St. Mathews	Fiber material, Coke, Pepsi Plastic containers etc.
3. Westvaco Charleston, S.C.	Paper and Pulp Manufactoring faculty
4. Medical University of South Carolina Charleston, S.C.	Department of Anatomy, Pathology Medcine, Biochemistry, Minority Center, Campus Tour

5. Savannah River Plant Aiken, S.C.	Nuclear Power Plant, Nuclear Waste disposal facilites SRL and SRE, General Tour of Plant
6. Riverbank Zoo Columbia, S.C.	Visit to Animal Shelter Place etc.
7. Water Treatment and Sewage Facilities	Orangeburg, SC

In addition to Scientific and industrially related trips, students participanted in several picnics at places such as Edisto gardens, Battery, Charleston; Capital, Columbia and had lunch in the SRS cafeteria. They also had BBQ at Dr. S. Sandhu's resident.

The Computer Science Program was supported by a computer laboratory, housing an interactive, time sharing, mini-computer system. The Computer Laboratory is located on the first floor of the air conditioned Science Center. The college owns a Digital Equipment Corporation VAX-11/750 RA81/TU80 computer system with 2 MB of ECC MOS memory and 456 MB of disk storage. The laboratory, a "user oriented" computer facility, has 9 VT 220's and 2 VT 240's (graphic) video terminals. The CRT terminal users were able to get hard copies from the LP 25 line printer.

The Chemistry Department is located on the third floor of the JST Science Center. The equipment in chemistry and the facilities in which it is housed are modern and more than sufficient for instructions at the college level (Professional B.S. in Chemistry). Claflin's Chemistry Department is particularly well positioned for this kind of project, in part, because it has received, since 1972, several research grants from the Environmental Protection Agency, the United States Department of Agriculture and the Department of Energy. The Department owns or has free access to a wide variety of scientific tools and equipment.

VII. The Chemistry Program

The chemistry program was designed and implemented by Dr. Walter Flomer, a youg P.h.D from Clemson (Assistant Professor of Chemistry). In addition to the previously mentioned general science objectives, the chemistry program had the following additional objectives.

A. Develop in students the basic knowledge and skills essential to the understanding of chemistry.

B. Develop skills of accuracy and precision in thinking, communication, experimental observation and manipulation

C. Develop an ability to interpret the properties and reaction of atoms and molecules in terms of structural theories.

D. Inspire in each student an interest in Chemistry as an exciting and useful descipline.

E. Guide Students to understand the elementary methods employed to conduct research in the area of Chemistry

In addition to recitations and discussions, in a relaxed classroom environment about the theoretical aspects of chemistry, students were led to perform laboratory work which enabled them to intuitively accept various chemical principles. They were encouraged to select research topics appropriate at their levels for conducting group or individual research. The activities of the chemistry program was organized as outlined below.

First Week. Students were exposed to some physical measurements, periodic table, atoms and molecules, followed by laboratory experiments relating to the theoretical aspects of these discussions. The students were exposed to chemical literature research and encouraged to select topics of their choice for group or individual research. The role and importance of chemical discipline for man and his environment were brought to their attention. Emphasis was placed upon the job and career opportunities which exist in this field.

Second Week. The students were led into the secret of chemical bonding, formulas equations, and classes of compounds. Laboratory was designed to reinforce the theoretical experience gained by them in the classroom. The students were encouraged to discuss with the instructor the topics of their choice for research for the final selection and approval of one of the research topics for further study.

Third Week. The students were exposed to the mole, energy, and weight relationship. The laboratory work was designed to calculate molarity, normality, equivalent weight, and prepare standard solutions of various acids, and bases. The students designed and set up experiments to meet their respective research objectives pertaining to their selected research projects and started collecting data or fabricating science projects.

Fourth Week. During this week students studied acids, bases, and salts. Theoretical aspects of proton donor and its relation to pH were discussed. The laboratory work was designed to determine the acidity of lemon juice, vinegar, and acid neutralizing power of various anti-acids available in the market. The student continued to work on their projects collecting data.

Fifth Week. The students were exposed to the gas laws, and the kinetic-theory of gases. Laboratory work was designed to study the diffusion and weight relations of gases, relations of pressure temperature, and volume were explored. Students fabricated their own equipment for these experiments. The students continued to collect research data and prepared manuscripts for seminars.

Sixth Week.: Final test was held. Research/Science Projects were written up for presentation at the seminars. Seminars were held (see enclosure 5). The Research and Science Project data were presented. Evaluation of the project activities was also done by the students.

VIII. The Computer Science Program

The Computer Science Program was designed and implemented by Dr. John Elwood, Associate Prof. of Chemistry who has good mastery of Computer field. Upon completing of the Computer Science Program, we expected the students to analyze simple scientific/mathematical type problems, to write BASIC programs for solving them numerically, to enter the programs on the computer, to correct the errors, and to execute them properly on the College computer system. The students were able to:

1. Analyze simple science/mathematics problems and to devise algorithms for solving them.
2. Express the algorithms in sequence of computer steps.
3. Code the steps in the BASIC language.
4. Enter the computer code into the computer system, edit the code, list the code, and execute the code.
5. Modify existing programs in order to meet a modified statement of the initital problem.
6. Use available software/methodology of C.S. for learning Chemical facts.
7. Application of computer for learning Chemistry.
8. Modify existing programs in order to improve them structuraly, and to make them clear, faster, and efficient.
9. Use computer jargon and concepts properly
10. Apply computer methods in fields like, sorting simulation gaming, word-processing, mathematics, economics engineering and the other science fields.

IX. Evaluation

Each student's performance was quantitatively evaluated through objectives type of testing procedure which was adopted by each participating instructor. Three tests, including the final two hour tests, were given in each area to evaluate

the learning potential of each student and his or her ability to perform in Science, Mathematics, and Engineering fields.

Each instructor also performed a qualitative analysis on each participant to evaluate his or her motivation, energy, and desire to succeed in their chosen academic field through intelligent particpation and hard work. Most of the participants (80%) after going through their training were absolutely positive to select careers in Science, Engineering and Computer Science. Students took advantage of the facilities made available to them at Claflin College to prepare for SAT etc.

The course outlines in Chemistry and Computer Science Programs offered, during the summer sessions at Claflin College have been supplied to participating schools, Department of Chemistry and Department of Computer Science at Claflin College, with the recommendations that each participant be awarded 4 Semester Hour credit in Chemistry and 3 Semester Hour credit in Computer Science.

X. Follow Up

Each participant at some future date will be provided with his or her confidential rating report and analysis of his or her future goals. The Director has designed and set up a mechanism to establish contacts with the students, for monitoring his or her Science, Engeineering and Computer Science careers. The students revisited Claflin College on home coming. They were college guests and were allowed to watch the pantherettes play basketball free. Follow up survey is being conducted currrently to evaluate participants academic status.

Monitoring of student progress will continue through out his or her college life to collect data to evaluate the degree of success of the project. The monitoring of students progress and his ultimate success will continue beyond the project period of summer 1993. College agreed to allocate resources to achieve this part of the project objectives. The college feels strongly about the validity and the usefulness of this project. Consequently it decided to commit its resources to

accept the responsibilities of bringing the project to successful completion and probably develop a model for use nation wide by other schools and colleges.

XI. Organization and Management

The project was initiated on June 8, 1993 to coincide with the College's Summer School of 1993. Its duration was six weeks. Dr. S.S. Sandhu carried the primary responsibility for the operation of the project. A SSETP Advisory Committee consisting of. Drs. John Elwood, Walter Flomer, Miss. Monica Lyles, and Mr. Darrin Smith was established. Dr. Sandhu served as chairman of this committee. Selection of participants was done by the SSETP faculty and staff.

The project instructors had a few days, prior to starting date, for the preparation of instructional materials for finalizing their plan of action for class, laboratory, research, and program activities.

The College General Fee allowed the participants to become involved in the athletic and social recreational programs, organized by the College. Nevertheless, two laboratory assistants were employed to serve (1) as coordinators of recreational programs (2) to coordinate the tutoring in supervised environment and (3) to help in Chemistry and Computer laboratories. The laboratory assistants served as mentors and chaperons for the participants. The Project Director's responsibilites also included the organization of student activities and visitation by the guest speakers.

The formal evaluation of the project programs was done first by students on end-of-semester evaluation forms. Secondly, by student laboratory assistants and finally, during the final week, the project instructors participated in the evaluation of project activities. The instructors met to share the experiences and evaluate the project from their prospectives.

XIII. Benefit of SSETP

A. Motivational:

Upon completion of this program most of the participants (80%) were motivated to enroll in high school science and mathematics courses, and hopefully had been working hard to prepare themselves for college entrance. Indeed, during the Fall Semester of 1994, the Project Director will try to invite school principals or their designees to estimate the general effect of the project on the pariticipants, and their subsequent classrooms performance.

B. Claflin College as Beneficiary

Availability of funds for summer academic programs in Chemistry were great attraction and inducement for 1993-94 freshmen class at Claflin College to opt for Chemistry career. Minority teens, especially of rural areas, have a very difficult time in getting rewarding summer jobs. The college, having received funding through this project, contributed richly to the professional growth of the student throughout his or her stay in the college. The added attraction of academic summer program in Chemistry along with the growing demand for Science and Engineering professional probably will contribute towards increased enrollment in the Department of Chemistry at Claflin College.

C. Academic Head Start:

The participants had a head start over the general high school population who intend to go to college. They have also favorable and promising start. Not only they earned 7 Semester Hours of credit 4 SH in Chemistry and 3 SH in Computer Science to carry to the college of their choice they also had an early taste of college life; the freedom and the responsibilities that follow such activites. They were able to see first hand the Chemists, the Computer Scientists, Physicistis and Physicians in action. They saw the role of Chemistry in Human Life.

STUDENT SCIENCE ENRICHMENT TRAINING PROGRAM INFORMATION DISSEMINATION

SSETP Brochure was published (enclosure). It provided information to the potential participants about the requirement for entering the SSETP program and their obligations. The brochures were mailed to the Science Teacher of every high school in the State of South Carolina which was followed by telephone calls to some schools, which are located in rural areas away from cosmopolitan cities. The program information was also disserminated through taking advisements in news papers, in cities like Charleston, Floreance, Columbia, Aiken, Greenville, and etc.

A few days prior to the initiation of the SSETP at Claflin College the Director of the Program was invited by the Jones Inter Cable TV, Orangeburg, S.C. for in depth discussion of the requirements and future impact of SSETP on Science and Engineering fields. The tape of this recording is available in the office of the Project Director. The taped program was screened for the TV viewing audiance in South Carolina.

A reporter from Times and Democrat, a popular local daily news paper; visited the college for an interview with the Director and to observe the SSETP students in operation. The reporter wrote an article which not only was complimentary to the program but also provided an in depth analysis of the program. The interviews with the various news media were arranged by the college Public Relation officer, Mrs. Lemon. A representative of Quicky Radio Station, St. Mathews, also visited the college to observe the SSETP participants in action. The final phase of SSETP which was high lighted by a banquet, award of certificates and achievement awards.

Addendum

1. 1993 Brochure
2. 1993 List of Participants
3. List of Guest Speakers For 1993
4. List of Visitations Sites For 1993
5. Seminar Presentation
6. Biographical Sketch of Participants
7. Awards Program
8. List of Award Winners
9. Awarded Certificates (highest Average etc)
10. Awarded Certificates (participants)

STUDENT SCIENCE ENRICHEMENT TRAINING INSTITUTE
1993

	Names	Address
1.	Alston, William	P.O. Box 935 Kingstree, SC 29556
2.	Barnes, Valerie	1716 Marley Drive Columbia, SC 29210
3.	Boston, Derrick	4801 Oaks Hwy Lamar, SC 29069
4.	Bradley, Belicia	Rt. 2 Box 1760 Cross, SC 29436
5.	Colter, Dana	Rte. 1, Box 310 Cross, SC 29436
6.	Dewitt, Christie	703 Rosemarie Lane Mullins, SC 2957
7.	Egleton, Regina	120 Miley Ave. Summerville, SC 29485
8.	Epps, Shani	140-D Amsterdam Dr. Columbia, SC 29210
9.	Franklin, Tanesha	Rt. 7 Box 82 Orangeburg, SC 29115
*10.	Goodson, Courtney	403 Guess St. Darlingotn, SC 29532
11.	Green, Lakisha	378 Bryant Rd. Reevesville, SC 29471
12.	Harris, Marlena	242 Skylark Lane Chapin, SC 29036
13.	Henneghan, Jenisha	P.O. Box 139 Coward, SC 29530
14.	Holloway, Sherita	1514 Redd St. N.W. Aiken, SC 29801
15.	Howell, Ronald	Rt 2, Box 1010 Cross, SC 29463
16.	Ingram, Walter	2419 High Hill Rd. Darlington, SC 29532

17. James, Frederick	Rt 1, Box 258 Stillwater Ln. St. Stephen, SC 29479
18. Johnson, Antoinette	105 Lincoln Boulevard Darlington, SC 29532
19. Keene, Tomika	1731 Black Creek Rd. Florence, SC 29506
20. Kelly, Lola	208 Waterford, Dr. Columbia, SC 29203
21. Lebby, Carl	3115 Burkeley Forest Dr. Columbia, SC 29209
22. Legree, Lance	P.O. Box 187 St. Stephen, SC 29479
23. Lewis, Abraham	5 B Wren Village Lake City, SC 29560
24. Love, Frederick	1805 Carousel Cir Columbia, SC 29203
25. McMillan, Eric	2304 Santee Ave. Columbia, SC 29205
26. McWeay, Simoné	233 Birdsnest Rd. Hartsville, SC 29550
27. Miles, Angel	P.O. Box 554 Wagener, SC 29164
28. Miller, Johnny	P.O. Box 209 Estill, SC 29918
29. Mitchell, La'Gena	500 Pittman St. Conway, SC 29526
30. Moore, Dion	P.O. Box 472 Hampton, SC 29924
31. Moses, Keisha	113 Chalk St. Eastover, SC 29044
32. Rice, Latoya	101 Hampton Av. Union, SC 29379
33. Shingler, Joyce	5135B Scarsdale Ave. North Charleston, SC 29418
34.Smalls, Octavia	P.O. Box 63 Ravenell, SC 29470

35. Smith, Avery	2207 Boyd St. Darlington, SC 29532
36. Sprowl, Dorenda	216 Mosley Rd. Greenwood, SC 29646
37. Stevenson, Chereta	109 Woodside Parkway West Columbia, SC 29170
38. Stukes, Khaleif	63 hoyt Heights Sumter, SC 29150
39. Summers, Pamela	1944 Priceville Rd. Gilbert, SC 29054
*40. Tolen, Christopher	P.O. Box 1556 Murrells Inlet, SC 29576
41. Toney, Patris	166 N. Lakewood Dr. Florence, SC 29501
42. Walker, Selena	2857 September Dr. Sumter, SC 29154
43. Washington, Marcus	1325 Stillfork Rd. Darlington, SC 29532
44. Watson, Vaneisha	309 Tucker Court Mullin, SC 29574
45. Whitesides, Cicely	676 Buckley St. Orangeburg, SC 29115
46. Wright, Bessie	Rt. 3 Box 434 St. Matthews, SC 29135
47. Jagit Grewal	142 Sharon Lake Dr. Lexington, SC
*48. Melissa Daniels	Rte 3 Box 84 Lake City, SC 29560
**49.Steven Hall	Rt. 2 Box 2220 Cross, SC 29436
**50.Allison Glasscho	Rt 2 Box 271 Mullins, SC 29574

*Drop out
**Did not show up

GUEST SPEAKERS
For
1993 Student Science Enrichment Training Program

Name	Topic
1. Dr. Oscar Rogers, Jr. Ed.D President, Claflin College	"Life Experience"
2. Bert Knessel, Ph.D Organic Chemist Ethyl Chemical Corporation Orangeburg, S.C. 29115	"Chemistry and You"
3. Dr. Roy Isabel, Director Research South Carolina State University	"Role of Research in Science Education"
4. Vernon Middleton, Vice President Alumini Affairs Claflin College	"Role of Claflin in our Community"
5. Henry Harris, Coordinator HBCUs Savannah River Site Aiken, SC	"Role of Minority in Science and Engineering"
6. Carl Clark, Physicist College of Science South Carolina State Univeristy Orangeburg, S.C.	"Super Conductivity"
7. George Lee, Director Admissions and Records Claflin College	"Claflin is Good for You?"
8. Earl Middleton Claflin Aluminus Owner Operator Coldwell Banker Real Estate Orangeburg, S.C.	" I made it, Can You"
9. Barney Jackson, M.D. Claflin Aluminus High Point North Carolina	"How to Prepare to Get into Medical School"

10. Mr. Budy Clark
Manager Public Relations
Dupont
Camden, SC

"More Scientists are Needed"

11. M. Nathaniel Edward
Claflin Aluminus
Dupont
Camden,SC

"Minority Scientist and Engineers"

12. Robert Sablis, Ph.D.
Director of Admission
USC Medical School

"USC Efforts to Enroll Minorities"

Visitations Sites
For
1993 Student Science Enrichment Training Program

Place	Importance
1. Ethyl Chemical Speciality Chemicals Orangeburg, S.C.	Iboprofin, Alkyl Aluminum and and several pesticide intermediates
2. Carolina Eastman Columbia/St. Mathews	Fiber material, Coke, Pepsi Plastic containers etc.
3. Westvaco Charleston, S.C.	Paper and Pulp Manufactoring faculty
4. Medical University of South Carolina Charleston, S.C.	Department of Anatomy, Pathology Medcine, Biochemistry, Minority Center, Campus Tour
5. Savannah River Plant Aiken, S.C.	Nuclear Power Plant, Nuclear Waste disposal facilites SRL and SRE, General Tour of Plant
6. Riverbank Zoo Columbia, S.C.	Visit to Animal Shelter Place etc.
7. Water Treatment and Sewage Facilities	Orangeburg, SC

SEMINAR

STUDENT SCIENCE ENRICHMENT TRAINING PROGRAM

SPONSORED BY

UNITED STATES DEPARTMENT OF ENERGY (HBCU)

SAVANNAH RIVER OPERATION OFFICE AIKEN, SC

CONDUCTED BY

CLAFLIN COLLEGE ORANGEBURG, SC 29115

ABSTRACT OF PAPERS

Alston, Timothy William, Kingstree Senior High School, Kingstree, SC,
HOW DIFFERNET SUNGLASSES ABSORB HARMFUL RAYS

The purpose of this project is to determine if society is aware of the importance of sunglasses for protection against harmful solar rays. This information is partly obtained by a five-question sunglasses I.Q. test.

My hypothesis was that the people I surveyed would have a low sunglasses I.Q. test score, therefore making thier knowledge of the important of sunglasses limited. After giving the I.Q. test to both teachers and students at my school, my hypotheses was proven wrong. For each question more than 50% of the 169 students surveyed answered correctly.

Therefore, people in general are aware of the importance of sunglasses for protection of our eyes. Thanks to labels that are attached to sunglasses people are more aware of the amount of light sunglasses are able to absorb. Hopfully improvements will be made to make lens even stronger. This concludes the summary of my projects.

Barnes, Valerie, Columbia High, Columbia, SC and Watson, Vaneisha, Mullins High, Mullins, SC.
INVISIBLE PAINTING

A pattern or drawing is painete don a large sheet of paper with colorless indicator solution and the patter is revealed when the paper is sprayed with a developing solution of sodium hydroxide.

Boston, Derrick Antron, Saint John's High, Darlington, SC.
PURIFICATION OF WATER

Sometimes natural waters contain dissolved mineral matter. The dissolved matter provides water with its taste; mostly because pure water has a very flat taste. Only small porportions of mineral water are desirable in drinking water, but first suspended insoluble matter and bacteria must be killed and removed. The easiest and simplest way of removing suspended matter is by using filtration. Also another way is by filtering water through gravel beds and sand, which is a main method for treating drinking water. In order to kill basteria, you must add a drop of iodine per quart water and let it stand a half hour. most of the time water is purified by distillation. Distillation is a process in which water is boiled and the vapor is condensed.

Bradley, Belicia, Cross High, Cross, SC.
THE FORMATION OF CRYSTALS FROM ALUMINUM

In my report, I will attempt to discuss and show how the metal aluminum, crystallizes when put inot potassium hydroxide. I will present the final product of this experiment and also the process and materials that I used to get the final product. At the end of my presentation, you will have seen how crystals form from aluminum and what causes this reaction.

Colter, Dana Trene'e, Cross High, Cross, SC.
HOW A COMPUTER WORKS

There are two basic components of a modern computer. They are hardware and software. Hardware is the physical equipment of a computer system. Software is the programming instuctions that tell the computer how to what to do and how to work. The most important part of a computer is the Central Processing Unit (CPU).
The computer has two different kinds of memory, ROM and RAM. ROM (read-only memory) is built in the computer and when the computer is turned off it is still in the computer when turned back on. RAM (random-access memory) is a temporary memory and it is not always there it can be written, erased, and written again.
Computer programs are stored on floppy disks or diskettes. When a computer loads a propram into the CPU, the oringinal program remains is placed in the RAM of the computer. The new the computer is the higher amounts of RAM is able to load more insturctions at a time.

Dewitt, Christie Deshea, Mullins High, Mullins, SC, Shani Epps, Columbia High, Columbia, SC.
THE FLAME TEST

The flame test was to dertermine would the flame test be the best way of detecting specific metal ions in a mixture of ions. We are trying to determine which element gave the most intense color. When the light is admitted, it tells the energy level of the element. We wanted to fine out which element was most easily identified.

Egleton, Regina, Fort Dorchestor, North Charleston, SC.
THE SCIENCE OF OBSTETRICS

My project deals with the stages of childbirth up until the dealivery. Also included is different ways a woman may have a baby, and the procedure an obstetrician would do. As with anything, there's also other ways a couple may have a baby whether infertile or what ever that is included in this project too.

Franklin, Tanesha, Edisto High School, Cordova, SC.
HOW TO MAKE A FIRE EXTINGUISHER

The purpose of my project was to make a fire extinguisher filled with water and chemicals to put out fires. My fire extinguisher was to be portable, easy to operate, and capable to put out small fires before the flames spread.
In my esperiment I used the following chemicals; biocarbonate of soda and aluminum sulphate along with vinegar to create a foam that would be capable of putting out a fire.
As stated above the chemicals did create a foam that was capable of putting out a fire.

Green, Lakisha, St. George High, St. George, SC.
HOW COMPUTERS MAKE ACCOUNTING EASIER.

My project shows how computers make accounting easier. It also shows how it saves the accountant time. It show how the computer does the work but the accountant just have to know what to put into it.

Grewal, Jerry, Lexington High School, Lexington, SC.
THE APPLICATION OF LASERS IN MEDICINE

A laser is a device that amplifies light. Laser stands for light amplification by stimulated emission of radiation. A laser's light is different than that produced by other sources of light. It travels in only one direction, the sides of the beam are almost paraleel, and it is narrow. Laser light also consists of few frequencies. There are many applications of lasers. They are used in communications, industry, medicine, military operations, and scientific research. This project is concerned with the use of lasers in medicine. Surgeons use the heating action of the beam to remove diseased body tissue. It burns away the unhealthy tissue in a short amount of time without damaging the surrounding area. Eye specialist use the heat of the laser to fix a loose retina back into place. There are three different types of lasers: solid lasers, gas lasers, and liquid lasers. Solid lasers are the most common type of laser. The parts of a laser are a power source and a light-amplifying system. the energy produced by a laser is less than that produced by the power source, but the light is more intense.

Harris, Marlena Rochelle, Chapin High School, Chapin, SC.
THE EFFECTS OF ACID RAIN ON THE ENVIRONMENT.

There are many environmental problems facing the world today. Acid Rain is only one of the many problems plaguing the planet. Acide rain is a type of rain caused by a relatively low pH (acid) due to air pollution. Acid rain is mostly found cities where there is large amounts of population, such as New York, Chicago, and Los Angeles. Acid rain is the cause the death of plant life and of fish and other marine life. Acid Rain is a problem that will continue to contribute to destruction of the planet.

Henneghan, Jenisha, Lake City High, Lake City, SC.
RADIATION EFFECTS ON CHROMOSOMES

The purpose of this research paper is to see how radiation can affect the chromosomes of cells. Aberation will be identified, the significance of aberrations in chromosomes, and types of aberrations. The mechanism of chromosme breakage will be identified. Chromosome stickiness and how it occurs will also be researched.

Howell, Ronald T., Cross High, Cross, SC.
COMPUTERS IN BUSINESS: FROM AN ACCOUNTING POINT OF VIEW

My research paper will be based on the relationship between computers and the field of Accounting. I will explain exactly how necessary computers are in the field of Accounting. I will attempt to describe all transactions, recordkeeping tasks, and other accounting related jobs that computers execute more quickly and more efficeintly. And with my personal knowledge of accounting combined with references and facts about this relationship, I will do my absolute best to present a research paper that will be not only beneficial to myself, but ot the intellect of my fellow classmates.

Ingram, Walter, Mayo High, Darlington, SC.
HOLOGRAPHY- THE FUTURE

In this report, the reader will be introduced to the science of holography. the hologram is a type of photograph that creates a 3-D allusion. In short the holographic in age appears real to the observer. My report highlights the background of holography and the making of a reflectio beam hologram. Holography will hopefully have its place in the world in the near future.

James, Frederick L., St Stephen High, St Stephen, SC.
HYDROGEN AS AN ALTERNATIVE ENERGY SOURCE

My project shall show why hydrogen could be used as an alternative energy source. My experiment shall consist of: collecting hydrogen, and showing how explosive it is. I shall speak to the audience telling them about hydrogen and its properties. At the end of the presentation if should be understood why hydrogen could be used as an alternate energy source.

Johnson, Antoinette M., Mayo High, Darlington, SC.
GENETICS

Genetics is a brance of biology which deals with the causes of inhertied resemblances and differences between individual and hence with the evoluation of all living things. Genetics has to deal witht eh makeup of chromosomes through the examples of research in fruit flies and a pea experiment.

Keene, Tomika, Wilson High, Florence, SC.
WHY ISN'T MARIJUANA LEGAL?

This project is going to compare the effects of marijuana on the human body as compared to the effects of drinking alcohol and smoking cigarettes harms the body. It will show, or at least it is aimed at proving that marijuana is no more harmful than alcohol and cigaretts and should be legalized it is able for those other two drugs to be legal under the circumstances in which they hold for humans to harm their bodies.

Kelly, Lola, Eau Claire High, Columbia, SC.
WHAT ARE THE EFFECTS OF BLEACH ON THE COLOR STAGES OF HAIR?

Hair goes through many color stages during the bleaching process. Six swatches of brown hair will be covered with a bleach mixture for 15 minute time intervals. The first swatch of hair will be removed from the bleach mixture after 15 minutes, the second swatch will be removed from the bleach mixture after 30 minutes, and so on until all of the hair swatches have been removed from the bleach mixture. (There will bbe a control swatch) After each swatch of hair is removed from the bleach mixture it is rinsed thoroughly with water and set aside to dry completely. The hair will then be analyzed to see the color change in different stages. The stages are as follows: brown, red, red-orange, orange, yellow,-orange, yellow and yellow-white.

Lebby, Carl, Lower Richland High, Columbia, SC.
WILL THE DIFFERENC BETWEEN SODIUM HYDROXIDE AND POTASSIUM HYDROXIDE CHANGE THE EFFECTIVENESS OF SOAP?

The purpose of this project is to test different types of soaps by changing the ingredients of the soap. To do this I will use Sodium hydroxide (Lye), corn oil, and sunflower oil to make different Lye soaps. For the second experiment I will use Potassium hydroxide instead of Lye to make two types of Potassium soaps. By doing this I would be able to test and compare the four bars of soap.

Legree, Lance, Stephen High, St. Stephen, SC.
NEUTRALIZING STOMACH ACIDE WITH A BASE

I will tell and show the effect of stomach acid and show how a base neutralizes it by ways of countering the reaction between hydrochloric acid and a phenolthalein solution. My neutralizer will be sodium hydroxide.

Lewis, Abraham, Lake City High, Lake City, SC.
WHAT ARE THE CAUSES OF GLOBAL WARMING

Magazines and newspapers often warn about the dangers of global warming. I hope to be able to describe some of the causes of global warming. I also want to name ways to prevent some of the dangers of global warming. Mainly I want to discard all the myths and find out the truth about global warming. The purpose of this research is to enrich my knowledge about global warming. Hopefully this knowledge will make me more capable of preventing the dangerous effects of global warming form happening.

Love, Frederick, W. J. KEENAN, Columbia, SC
THE COMPUTER VIRUS

A computer virus is a program that is intended to do something in a system that is not ask to be done. What gives the computer virus its name is that is comes along with other programs similarly to the way a disease virus infects a

cell and is reproduced when the cell reproduces. Computer viruses can be avoided through vaccines and cleanup procedures. If a computer already contains a computer virus then there are ways of getting rid of the virus. Some computer viruses are very simple and some are very complicated, but they all will eventually be eliminated.

McMillan, Eric, A.C. Flora High School, Columbia, SC.
ALL YOU WANT TO KNOW ABOUT HEPATITIS

Hepatitis is a disease that involves inflammations of the liver. The two major type of viral hepatitis are hepatitis A and hepatitis B. There is also toxic hepatitis. Hepatitis A can be contracted by drinking contaminated water or eating contaminated food. Hepatitis B, today, is mainly spread by use of improperly sterilized medical instruments by hypodermic needles in drug dealers and engageing in sex with infected people. Vaccine are availabel to protect against hepatitis B.

McWeay, Simone, St. John High, Darlington, SC.
MENTAL RETARDATION AND IT CAUSES

To date, there is a record of 5.5 million mentally retarded people in the United States. What are the causes that developed throughout the world? Most cases that developed before birth were caused by diseases in the fetus or by the mother or caused by genetic factors. Other cases recorded after birth were caused by childhood sickness or trauma.

Miles, Angel, Wagener-Sally High, Wagener, SC.
HOW TO MAKE BLEACH.

In my experiment I was suppose to be able to make bleach using scientific and common items such as a jam jar, silicone caulk, table salt, card board water, 6-volt battery, and charcoal.
The end results of my experiment was suppose to be that bleach could be made by using simple household materials along with some scientific items.

Miller, Johnny, Estill High, Estill, SC.
DO HAMSTERS LIVE BETTER IN A NATURAL ENVIRONMENT OR A PET ENVIRONMENT?

The purpose of this research is to find out whether a hamster lives better in a natural environment or whether it would live better in a pet environment. I discovered that a hamster living in a natural environment lives better than a hamster in a pet environment. The hamseter in the natural environment displays more activity.

Mitchell, La'Genia, Conway High, Conway, SC.
HOW TO USE THE PROGRAM OBASIC

My reseach paper will be based on how to use the QBASE Program in everyday use. I will explain how to use the different languages and what they mean. I will show how you can draw, paint, graph, play music, and many other things that can be program with QBASIC.

Moore, Dion, Wade Hampton High, Hampton, SC.
CANCER-CAUSING ORGANIC

My report will explain what cancer is and tell what certain things cause cancer. Then I will give a full view of the chemicals that cause cancer. Finally I will show the treatments and preventsion of cancer.

Moses, Keisha, Five Points High, Columbia, Stevenson, Chereta, Brookland Cayce High, Cayce, SC.
BIRTH CONTROL OPTIONS

Birth Control comes in different methods, it is a personal decision that is made by you, with help from a physician. The different birth controls depends on your age, current health, frequency of sexual activity, and also your partners feelings about you being on birth control. Some forms of birth control that are carried are implants and diaphragms, but the mostly commonly used is the pill.

Rice, Latoya, Union High, Union, SC
THE AIDS PANDEMIC

The Aquired Immunode ficiency Syndrome Pandemic, also referred to as the aids epidemic has with a venqeance, awakened people to the danger and of aquiring infectious, drug-related, and sexually transmitted, diseases, has ultimately forever changed the way doctors and scientists all over the world, think in terms of such seriously life threatening ciraumstances.

Shingler, Joyce, North Charleston High, North Charleston, SC
GRAPH COLORING

Graph coloring has many applications in today's world such as map coloring and computer storage problems. Even though many graphs can be colored manually, the more complex graphs can be quite time consuming to color. My project is on how to make graph coloring easier and faster.

Smalls, Octavia, Middleton High , Charleston, SC.
AIR AND WASTES POLLUTION

Air pollution occurs when wastes dirties the air. Artificially created wastes are the main sources of air pollution. They can be in the form of gases or particulates (tiny particles of liquid or solid matter). Such wastes result chiefly

from the burning of fuel to power motor vehicles and to heat buildings. They also come from industrial processes and the burning of solid wastes. Natural pollutants (jimpurities) include dust, pollen, and soil particles. The major sources of air pollution vary from city to city. Automobiles in produce nearly all the pollution in the Los Angeles area. Furnaces in apartment and office buildings cause most of the contamination in New York City. Chicago's air pollution comes equally from industry, motor vehicles, and heating plants.

Smith, Avery, Mayo High, Darlingtong, SC.
THE EFFECTS OF ANABOLIC STEROIDS ON VARIOUS ATHLETES

Through the use of various case studies made by several sportswriters on assorted athletes, I would like to show the effects that anabolic steroids have had on the human body. Steroids have been used by athletes who have been involved in track, weightlifting, football, and body building. Some of these people have been observed to have had agressive changes in behavior and rapid weight gains, as well as many other strange bodily functions.

Sprowl, Dorenda Michele, Greenwood High, Greenwood, SC.
HOW ELECTRICITY WORKS

There are many devices that electricity can flow through. Everything in today's society is run mainly on electricity. We would not be able to operate without electricity. We would not be able to do simple things like turn on lights or reheat leftovers. Electricity is a main source in our daily living.

Stukes, Khaleif, Sumter High, Sumter, SC.
FIBER OPTICS

In my research report I plan to explain different usages of fiber optics of today and plans for tomorrow. My project shall enable anyone to have a better understanding of how fiber optics can be used. Fiber optics will be explained in a way that makes it mentally sound to be used on a large scale.

Summers, Pamela, Gilbert High, Gilbert, SC
WORDPERFECT: THE PERFECT WAY TO ORGANIZE DOCUMENTS

As a student or a member of the business world, creating documents is a frequent task. This task can sometimes be difficult if the document is long, because the preparer's notes can be unorganized. One paragraph may be on one page while the corresponding picture is on another. Combining the two could be difficult, but with WordPerfect, all of these problems can be solved. This paper will show how WordPerfect can be used to create elaborate documents efficiently.

Toney, Patris, Maranatha Christian, Florence, SC.
OPTICAL ILLUSIONS

In many instances the assumed correspondence may hold and we regard the

perception as veridical. If, however, one or more of these assumed correspondence proves incorrect, we term the perception as illusion. Accordingly, the illusions simply indicate the inadequacies of the assumed correspondences. They can be likened to the visible tops of iceburgs; they indicate hidden regions of ignoance about the workings of perceptual processes.

Walker, Selena, Sumter High, Sumter, SC.
INTEGRATED COMPUTER SYSTEMS vs. INDIVIDUAL COMPUTER SYSTEMS

Research integrated systems and individual systems. Write a theoretical comparison. Illustrate difference by running same data through each system. The applicatin programs to be used will be word processor, electronic spreadsheet, graphics, and data base. The theoretical comparison will include an explanation of computer systems, two types of programs (system and application), advantages, disadvantages, and examples of both integrated and individual systems, plus a conclusion reached through the extensive research.

Washington, Marcus Vann, Mayo High, Darlington, SC.
LASERS

Lasers have proven to be very helpful to many fields of science, businesses and corporation. The light that is amplified by a laser have been used in complicated surgery, welding in factories, and used to travel through glass fibers to carry telephone entries. Lasers are doing and will continue to do amazing work for all walks of life.

Whitesides, Cicely Rhea, Orangeburg-Wilkinson High, Orangeburg, SC.
COMPUTER LANGUAGE

My research project is about computer language categories. Although programs must ultimately be expressed in the relevant machine language in order to be accepted by a computer, to alleviate some of the problems and to shorten the programmer's tasks, assembly, or mnemonic, languages were created. I will give examples and show how it is done.

Wright, Bessie, Calhoun County High, St. Matthews, SC.
ALZHEIMER'S DISEASE

Alzheimer's disease is a neurological disorder of the brain, first described in 190 It was once through to be a rare disease but, now it's considered to be the largest single cause of senile demential as well. It is the most common cause of intellectual deterioration in the elderly and the middle-aged. The cause of the disease is unknown. The symrptoms include progressive decline in memorys lose of mental faculties such as learning attentions and judgement. There is no cure treatment is done by helping the family to cope with the situation.

BIOGRAPHICAL SKETCH

OF

STUDENT SCIENCE ENRICHMENT TRAINING PRGORAM PARTICIPANTS FOR 1993 SUMMER

William Timothy Alston is the proud son of Mr. and Mrs. Laurie (Veronica) Alston. William lives in Kingstree, SC where he attends Kingstree Senior High. He is an active member of the Student Council, 4-H Club secretary , Foreign Language Club, AP English Scholar and United Methodist Youth Secretary William plans to attend Morehouse College and major in Pre. Med.

Valerie Denise Barnes is the niece of Ms. Pertell Nesbitt. Valerie attends Columbia High School where she is a rising senior. Throughout her high school years, Valerie has been in many clubs such as National Honor Society, Future Hommakers of America and Cap-a-letters, to name a few. Valerie has maintaned a 3.4 average and she has been on the A-B honor roll. Also, Valerie has been recognized as a Columbia Hihg School Scholar. Valerie's Goal for the future is to continue her education by going to college and majoring in biology.

Derrick Boston is the son of Linda and Samuel Boston. He attends Maxwell Baptist Church in Florence, South Carolina. Derrick is a student at Saint John's High School in Darlington, South Caorlina. He has been promoted to the eleventh grade. He is a member of the Key Club and Studnet Council. Derrick has had Perfect Attendance throughtout his Middle and High School career. Derrick has been a Honor Roll studnet throughout his life. He has been named the most Valuable defensive player of the J.V. team. He is also a letterman in track and manager of the Varsity basketball team. He is a two-year participate in JROTC program.

Belicia Kanetta Bradley is the daughter of Mr. and Mrs. Jeremiah and Martha Bradley. She was [redacted] Along with her two sisters Farenda and Marquita, Belica resides in Cross, SC. Belicia attends Cross High School where she is presently a rising sophomore. At school, she is thought of as a leader and a helper among her peers. She is currently Vice-President of her class, a member of F.B.L.A., T.A.D.D., National Beta Club, the Band, Delta Teen, and the Quest and Mathcount competitions. Belicia is also a proud member of the New Home Baptist Church in Oakley, S.C. She directs and participates in the Jr. Choir, and is part of the Usher Board. In the future, Belicia hopes to attend Howard University majoring in Mathematics and minoring in Educaion. Someday she will be a college professor teaching mathematics.

Dana Trene'e Colte was [redacted] She isa rising Junior at Cross High School. Her parents are Vivian and Joseph Bryant. Dana have two younger sisters, Keri Watson (11) and Angel Bryant (2 months).

In school, she maintain at least a B+ average in most of her classes. Dana has had perfect attendance in the seventh through the ninth grades. She is a clarinet section leader for the Cross High Marching Band. She is a member of the Future Business of America (FBLA), Teens Against Drunk Driving (TADD), the Black History Bowl, the Math team (Quest), and the National Honors Society. Dana was also selected for Who's Who Among Ameriacn High School Students in 1992.

Christie Deshea Dewitt the daughter of Mrs. Annie Dewitt. Christie is 17 years old and attends Mullins High School where she is a rising senior. Her Hobbies are playing Basketball, Dancing, and Cheering for Mullins High School. Christie is in the Spanish Club, Girls Club, Dare, Club, and Black Awarenss Club, After high school, Christie plans to attend College where she can further her education.

Regina Egleton is a sixteen year old honor student from Summerville, SC. where she attends Fort Dorchestor High. Regina, was [redacted] to Mr. and Mrs. Willie (Janice) Egleton. She has two sisters and one brother. Regina plan to attends Grambling or Howard Universities to major in Science and minor in mathematics.

Shani Faraja Epps is the daughter of Mrs. Deloris Epps. She attends Columbia High School where she is a rising senior. Shani is a member of various clubs such as french club, Sechme, FBLA, Executive Vice President of student council, she plays in the marching, jazz and concert bands. She is also an honor roll student. After she graduates from high school, she plans to attend Georgia Tech. in Atlanta where she will major in engineering.

Tanesha Franklin, daughter of George and Roetha Franklin, was [redacted] She has one brother, Narone. Tanesha is a rising Junior at Edisto High School, in Cordova, South Carolina. In the past years Tanesha has been awarded many awards. Some of them are as follows: Miss Freshman Homecoming, Miss Sophomore May Court, Honor Roll, United States Achievement Academy Award, Daughters of the American Revolution Award, and Second place winner in the Science Fair in the Environmental Catogory. Tanesha has recently been nominated to be included in the 27th Annual Edition of Who's Who Among American High School Students.

Lakisha Green was [redacted] to Mr. and Mrs. Isaac Green. She is 15 years old. Lakisha has three older brothers. Her hobbies are shopping, talking on the telephone and hanging out with her friends. She attends St. George High School and is going to the tenth grade. Lakisha is a active memeber of the Shine Club, Jets Club, the Yearbook Staff and the Honor Society. After high school she plans to go to college and major in accounting and minor in Computers.

Jerry Singh Grewal was [redacted] to Dr. and Mrs. Harpal Grewal. Jerry is 15 years old and attends Lexington High School where he is involved in the French club, French Lhonors Society National Honors Society, and many other clubs. Jerry also won the Presidential award and Perfect attencdance award at his school.Jerry future plans are to go to Duke University so that he can study to become a radiologist.

Marlena Harris is the daughter of Mr. and Mrs. Albert Harris, Jr. she was [redacted]. Marlena has one sister Melanie and one brother Marcus. Marlena is a rising Junior at Chapin High School, where she is a member of the THOT Club. She is also a member of the Fellowship Baptist Church Junior Choir. Her Hobbies are traveling, shopping, playing and watching sports throwing shotput and discus on the track team, and going out having fun. Her future plans are to go to college to become a sucessful obstetrician and gynecologist.

Jenisha Henneghan is the daughter of Jefferson and Linda Henneghan. She has one brother Tedric. Jenisha is a rising sophomore at Lake City High School. She has received several awards for perfect attendance, honor roll, Presidnetia Academic Fitness Award, top 5% of freshman class, and several music awards. Jenisha is a member of the African American Awareness Club, Beta Club, Lake City Blue Guard Marching Band, Basketball team, Track team, and Pep Band.

Sherita Kirende' Holloway was [redacted] She is the daughter of Albert and Cassandra Holloway. She attend Aiken High School were she is a sophomore. Sherita is a member of the Drama Club, Jonetta Edwards Federated Girls Club, NAACP and Teen Fourm. At school she is in the N.J.R.O.T.C. Some of Sherita awards includes Miss Teen Fourm 1993, Honor Cadet, and 1st place & 2nd place in science fairs. In the future she plans to go to the college of her choice to major in biochemistry.

Ronald Howell lives with his family in Cross, SC. He is a rising senior at Cross High School. Ronald have had many success during his years at Cross High. He is a member of the honor society, spanish club, and black history bowl team. Ronald serves as the president of the spanish I class, and he is a consistent honor roll student. Ronald also participate in many athletic programs as well as academic. He plays football runs track plays the trumpet, and act in school plays. Ronald said that he is proud of his extremely positive lifestyle. A lifestyle that is responsible for his being a Child of God and a lifestyle that will enable him to accomplish anything he put his mind to.

Walter Lashon Ingram is the distinguished son of Ms. Evelyn Ingram of Darlington, SC. He is the youngest member of a family of four. Walter, a graduate of Mayo High School, was salutation of the class of 1993. He will attend North Carolina A&T State University this fall where he will major in Mechanical Engineering. While at Mayo, Walter was a active member in the Student Council, Junior and Senior Class Presidnt, Band, Yearbook Staff,

Abraham Lewis is a student at Lake City High School. He is presently involved in many actives atht includes school, church and the community. He is presently a member of the Beta Club and teacher Cadet. He is a student with a 3.5 GPA. He also is a member of the track team. Abraham has received the honor roll award several times. Most important Abraham feels that he has gain the respect of his friends and his community and is trying to make a difference.

Frederick Love is the son of Frank and Glinda Love. He was [redacted] He currently live in Columbia, South Carolina. Fred is a rising Junior at W. J. Keenan High School. He runs cross-country, plays basketball and tennis. His academics has allowed him to be on the honor roll for two consecutive years. The clubs that he has participated in is the National Honor Society, S.E.C.M.E. club, and Sports club. He is also a high school scholar, 3rd place winner in the school science fair for the chemistry division, and has maintained a 3.8 GPA. Fred is now pursuing a career in engineering.

Eric McMillan is the son of Mr. and Mrs. Arthur and Tommye McMillan. He attends A.C. Flora High School where he is a rising senior. Eric hobbies are sports trivia, reading, play basketball, swimming, and watching TV. Eric plans to attend college and become a successful parapsy cologist.

Simone McWeay was [redacted] 17 years ago on [redacted] She is the daughter of Sharon Wingate and Bruce McWeay as the second child of five. She recently graduated from St. John's High in Darlington, SC as a honor student. During her high school career she participated actively in the Drama, debate, pep, latin, french & Afro- American Clubs. She also has received numerous acdemic and club participation awards but her greatest reward is her son Tajeem Alaric Madrid Davis. In the fall Simone plans to attend Howard University and major in medicine.

Angel Miles is from Wagener, SC where she lives with her mother and stepfather. She has one sister and one brother. She is a rising junior at Wagenr-Salley High. Angel has receive many awards one in U.S. History, Algebra 2 and Germetry. She was selected to attend the first Aiken County Youth Forum at Aiken Tech. This fall Angel will be in the Beta Club, because she have maintain higher that a 3.0 GPA. She plans to go to college in Alanta and major in secondry education or civil engineering.

Johnny Miller is the son of Johnny and Beverly Ervin. He has one sister and one brother. Johnny hobbies are collecting comic books. He also enjoy reading and writing poetry. Johnny is a 1993 graduat eo Estill High and will be attending Claflin College in the fall for the next four year on a presidental scholarship. While at Estill Johnny was a member of the track, baseball and weightliftly team. He was co-editor of the yearbook staff, student council and science club.

La'Genia Mitchell is the daughter of Josephine C. Richardson. She is a

granddaughter of Mr. & Mrs. Bishop T.O. Manigo. La'Genia is currently a rising Junior at Conway High School. She has received many awards, has been very active in clubs at her school, and as well as out of school. La'Genia plays the saxophone on the Conway High School Tiger Regiment Bane. La'Genia awards have included being inducted in the National Junior Honor Society., National Honor Society, National Spanish Honor Society, and Who's Who Among America's High School Students. Some clubs include the Awareness club, FTA and key club. La'Genia plans to go to North Carolina A&T Univesity to major in computer scinece and minor in business management.

Dion Moore is rising senior at Wade Hampton High School, where he plays football. Dion is acknowledged as a Who's Who Among Americna High School Students and an American Scholar. His interest includes football, basketball, track, weight-lifting, swimming and traveling to place to place meeting exciting people.

Keisha Moses is the daughter of Henrietta Moses Cooper and Freddie Campbell, Jr. She is a rising senior at Five Point High in Columbia, and has an 3.0 grade point average.

Latoya Rice is the daughter of Barbara Ann Rice of Union, SC. She was [redacted] She is a rising sophomore Union High. She is a part of hte honors society and has now completed her 9th year as a member of the "Emerge" program, which is a program developed for gifted and talented students. Latoya is a member of clubs such as T.I, the Beta Club, and the black awareness association. Her hobbies include writing, which has allowed her to win such honors as the Lieutenant Governor's Writing Awards, and many publihings in Scope Scholastics, and the Weekly Reader, which are two very well-known children's magazines. Latoya future plans are to graduating from high school with top honors and going to college majoring in biochemistry and/or journalism.

Joyce Irishelle Shingler is the daughter of Robert and Cecilia Shingler. She has an older brother and an older sister. Joyce came to the United States on December 17, 1987. She attends Mims Academy where she is a rising junior and is on the honor roll. Joyce is very athletic she plays basketball and softball for her school. She received many awards such as the S.C. State Award for maintaining a 3.5 point average while playing sports. Joyce is interested in learning about fighter planes and plans to attend college at the Air Force Academy where she can pursue her goal as an F-16 pilot.

Octavia Smalls is the daughter of Mr. and Mrs. Herman and Ophelia Smalls. She was [redacted]. Along with her three brothers, Octavia resides in Ravenel, S.C. She attends Middleton High School. where she is a rising sophomore. Octavia won a $10,000 scholarship along wth a citizenship, perfect attendance, spanish, english, and math awards. In the future Octavia wants to go to college and become a pediatrician.

Avery Smith is a 1993 graduate of Mayo High School in Darlington, SC. He

will be attending the University of South Caorlina in the fall. During his four years of high school, he was a member of the Future Teachers and Business Leaders of America, spanish club, and the National Honor Society. He was also listed among the Who's Who Among High School Students and the National Honor Roll.

Dorenda Michele Sprowl is the daughter of Mr. and Mrs. Robert Sprowl. She is a rising senior at Greenwood High School. She is a member of the National Beta Club, junior civilitans, and the classical junior classical league. Dorenda have been nominated as Who's Who Among America's High School Students. Her hobbies consists of putting together electrical circuits, playing ping-pong, golf and experimenting with computers in general.

Chereta Stevenson is a rising junior at Brookland-Cayce High School in Cayce, SC. , oldest of three children, daughter of Mr. and mrs. Amos Stevenson, presently of West Columbia, SC. Her favorite hobbies are basketball and softball. At school she is currently on the varsity softball, baskety ball and volleyball teams. She was captain of thevarsity basketball team and received the offensive award in softball, she's a member of the FBLA club, key club and Afro-American History Club. After Graduating from high school she plans to attend Grambling University or North Carolina A&T .

Khaleif Stukes was [redacted] to Mr. and Mrs. Herman Stukes. He has two brothers and one sister. Khaleif attends Sumter High. He as won many awards such as perfect attendance, honor roll, second place at the SECME compition for an essay. Khaleif have been nominated for Who';s Who Among High School Students.

Pamela Alexis Summers is the daughter of Drs. John and Diane Summers, and has one brother and one sister. She is a risting junor at Gilbert High School, and resides in Gilbert, SC. Pamela was a writer for the newspaper staff, a member of the cheerleader club, a member of youth in Government, and reporter of the Beta Club. . As a participant in the Miss South Carolina American National Teenager Pageant, Pamela earned the title of 1st runner up in the Senior Divison. Throught this pageant, Pamela received the citizenship award with entitles her to a scholarship at Ecked college in Florida or Johnson and Wales in Rhode Island. Pamela enjoys swimming, and plans to become a lifeguard with in the next year. She plans to pursue a career in genetic engineering.

Patris Annee Toney is a rising Junior at Maranatha Christian School in Florence, S.C. She is the daughter of Mr. and Mrs. Samuel L. Toney Sr. Patris have received many awards, which includes music, highest GPA in Frenceh, and perfect attendance awards. She is a charter member of our National Honor Society, a member of our basketball and cheerleading team alon with tutoring.

Selena Walker was [redacted] to Gregory

Wagner and Mary Belle Walker. She has two brother Thaddeus and Gregory. Selena is a rising senior at Sumter High School. After graduating from high school she plans to attend Spelman College and major in biomedical engineering.

Marcus Vann Washington is the pround son of Mr. and Mrs. Russell M. Washington. Along with his brother Coy, Marcus resides in Darlington, SC. During his freshmen and sophomore years at Mayo High School, Marcus has racked up numerous awards in mathematics, science, english, typing, spanish and government. Recently, Marcus has received an appointment to the Governor's School for science and mathematics at Hartsville's Coker College. Marcus is a member of the Student Council, Honor Society, Student Action for Eduction (SAE), Spanish Club, Academic Challenge Team, and Youth group at Lee Street Church of God. In addition, Marcus plays football, baseball, basketball and tennis.

Vanish Watson is the Daughter of Mr. and Mrs. Randy Watson of Mullins, SC. She is seventeen and a rising senior at Mullins High School. She has been nominated for Who's Who Among American High School Students and as a congressional scholar. She has been a member of the National Juinor Society and Proteam at Mullins Jr. High. She is a member of the National Honor Society, Spanish Club, SAT Club, and Teacher Cadets. She attended Mullins High School's 1993 graduation ceremony as a Junior Usher. She now holds a strong 3.0 GPA and plans to attend college after high school.

Cicely Rhea Whitesides is a rising senior at Orangeburg-Wilkinson High School in Orangeburg, South Caorlina. She is the daugher of Ms. Hilda P. Whitesides and Mr. Louis Whitesides. She is the youngest of three children. Cicely have participated in varsity track, varsity softball, varsity basketball, FBLA, Key Club, student assistant, student council, blue angels, flight commander and currently a varsity cheerleader. She has been nominated for Who's Who Among American High School Students. Her hobbies are basketball, volleyball, softball, swimming, singing, and dancing.

Bessie Mae Wright is the daughter of Abraham and Dorothy Ann Wright. she is the eldest of nine children. Bessie is a sixteen year old rising junior at Calhoun Sounty High School in St. Matthews,SC. She have received several awards from perfect attendance, honor roll, computer operations, driver's education, JROTC, mathematics, english, science and was nominated for Who's Who Among American High School Students. She is a member of JROTC program, softball team, and FHA. After completion of High school she plans to futher her education at a college or university.

PROGRAMME
Dr. S. S. Sandhu, Presiding

Invocation and Grace	Mr. Ronald Howell
Lunch	
The Occasion	Dr. Oscar A. Rogers, Jr. President
The Experience	Miss Belicia Bradley Miss Walter Ingram
Duet	Miss Cicely Whitesides Miss Selena Walker
Poem	Miss Monica Lyles
Award of Certificates	Miss Sylvia Green Special Project Manager
	Dr John Elwood Associate Professor Chemistry
Achievement Awards	Miss Marlenia Murry Assistant Equal Employment Opportunity
	Miss Rita Freeman Assistant Manager Black Employment
	Dr. Walter Flomer Associate Professor Chemistry
Special Presentations	Dr. S. S. Sandhu
Announcements	Dr. S. S. Sandhu
Benediction	Mr. Abraham Lewis

First Place in Science

Lola Kelly — "What Are the Effects of Bleach on the Color Stage of Hair"

Second Place in Science

Carl Lebby — "Will the Difference Between Sodium Hydroxide and Potassium Hydroxide Change the Effectiveness of Soap"

***Third Place in Science**

Patris Toney — "Optical Illusions"

First Place in Computer Science

Selena Walker — "Integrated Computer Systems Vs. Individual Computer Systems"

Second Place in Computer Science

Frederick Love — "The Computer Virus"

Consolation in Science

Octavia Smalls — "Air and Water Pollution"

Marcus Washington — "Lasers"

Consolation in Computer Science

Pamela Summers — "WordPerfect: The Perfect Way to Organize Documents"

Highest Average in Chemistry
Jerry Grewal

Consolation in Chemistry
Frederick James

First Place in Science

Lola Kelly — "What Are the Effects of Bleach on the Color Stage of Hair"

Second Place in Science

Carl Lebby — "Will the Difference Between Sodium Hydroxide and Potassium Hydroxide Change the Effectiveness of Soap"

***Third Place in Science**

Patris Toney — "Optical Illusions"

First Place in Computer Science

Selena Walker — "Integrated Computer Systems Vs. Individual Computer Systems"

Second Place in Computer Science

Frederick Love — "The Computer Virus"

Consolation in Science

Octavia Smalls — "Air and Water Pollution"

Marcus Washington — "Lasers"

Consolation in Computer Science

Pamela Summers — "WordPerfect: The Perfect Way to Organize Documents"

Highest Average in Chemistry
Jerry Grewal

Consolation in Chemistry
Frederick James

Student Science Enrichment Training Program

Claflin College, Orangeburg, SC 29115

and

United States Department of Energy (HBCU)

Award this certificate to

For

Highest Average in Computer Science

S. S. Sandhu, Ph.D
Director, Special Project
Claflin College
Orangeburg, SC 29115

Oscar A. Rogers, Jr.
President
Claflin College
Orangeburg, SC 29115

Student Science Enrichment Training Program

Claflin College, Orangeburg, SC 29115

and

United States Department of Energy (HBCU)

Award this certificate to

For

Participation in the

1993 Student Science Enrichment Training Program

S. S. Sandhu, Ph.D
Director, Special Project
Claflin College
Orangeburg, SC 29115

Oscar A. Rogers, Jr.
President
Claflin College
Orangeburg, SC 29115

DATE
FILMED
9/16/94

END