DOCUMENT RESUME

ED 413 821 HE 030 724

AUTHOR Selfe, Sara
TITLE Outreach Program for High School and Pre-Service Science Teachers of Native American Students, 1993-1996, Final Report.
INSTITUTION Washington Univ., Seattle. Dept. of Chemistry.
SPONS AGENCY Fund for the Improvement of Postsecondary Education (ED), Washington, DC.
PUB DATE 1996-12-00
NOTE 159p.
CONTRACT P116B30051
PUB TYPE Reports - Descriptive (141)
EDRS PRICE MF01/PC07 Plus Postage.
DESCRIPTORS Alaska Natives; *American Indians; *Chemistry; Cognitive Style; Computer Uses in Education; Cultural Differences; High Schools; Higher Education; Inservice Teacher Education; *Institutes (Training Programs); Outreach Programs; Postsecondary Education; Preservice Teacher Education; *Science Teachers; *Secondary School Teachers; Summer Programs
IDENTIFIERS *Native Americans; Preservice Teachers; *University of Washington; Washington

ABSTRACT

This final report describes achievements and activities of the Native American Science Outreach Network (NASON), a 40-month program of the University of Washington which provided 4-week summer institutes for high school and preservice science teachers of Native American students. The goal was to update the teachers' chemistry skills, and to integrate chemistry labs and computerized curriculum techniques with training in tribal learning styles and cultural characteristics. The ultimate goal was to increase the participation of American Indians and Native Alaskans in chemistry programs at the university level, and in science-related careers. Middle school teachers, paraprofessionals, and high school students were added to the program for a three-year total of 128 participants. NASON linked teachers and university staff through e-mail, established weekend teacher workshops for follow-up and evaluation activities, and visited participants' schools. The project also produced curriculum and resource guides, and a CD-ROM guide to the tribes of Washington State. Evaluation indicated that participants became more knowledgeable and more comfortable about both science and cross-cultural relationships. After an executive summary, individual sections provide information on the project's purpose, background and origins, description, evaluation/results, and conclusions. Appendices provide schedules for each summer institute and evaluation reports. (DB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: HE
In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view. SE

ED 413 821

NATIVE AMERICAN SCIENCE OUTREACH NETWORK (NASON)

From 1993-1995, the FIPSE NASON program provided four week summer institutes for high school and pre-service teachers of Native American students. The goal was to update teacher's chemistry skills and integrate chemistry labs and computerized curriculum techniques with training in tribal learning styles and cultural characteristics. Through other funding resources, middle school teachers, para-professionals and high school students were added to the program for a three year total of 128 participants. NASON linked teachers and university staff through e-mail, established weekend teacher workshops for follow-up and evaluation activities, and visited participants' schools.

Sara Selfe
Senior Lecturer
Native American Science Outreach Network
Department of Chemistry 351700
University of Washington
Seattle, WA 98195-1700

Telephone Number: 206-543-7835
Fax: 206-685-8665
Email: selfe@chem.washington.edu

Project Reports:	FIPSE Native American Science Outreach Network (NASON)
Products:	NASON Resource Guide
	NASON Curriculum Guide, 1994, 1995, 1996
	Tribes of Washington (NASON Resource Guide on Macintosh CD-ROM)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

HE 030 724

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: HE
In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view. SE

COVER SHEET

Grantee Organization:

University of Washington
Native American Science Outreach Network
Department of Chemistry 351700
Seattle, WA 98195-1700

Grant Number:

P116B30051

Project Dates:

Starting Date: 9/1/93
Ending Date: 12/31/96
Number of Months: 40 months

Principal Investigator

Dr. Sara Selfe
Senior Lecturer
Department of Chemistry 351700
University of Washington
Seattle, WA 98195-1700

Telephone Number: 206-543-7835
Fax: 206-685-8665
Email: selfe@chem.washington.edu

FIPSE Program Officer:

David Johnson

Grant Award:

Year 1:	$65,087
Year 2:	$68,472
Year 3:	$71,762

HE030 724

EXECUTIVE SUMMARY

Project Title: Outreach Program For High School And Pre-Service Science Teachers Of Native American Students

Grantee Organization: University of Washington
Native American Science Outreach Network
Department of Chemistry 351700
Seattle, WA 98195-1700

Principal Investigator: Dr. Sara Selfe
Telephone Number: 206-543-7835
Fax: 206-685-8665
Email: selfe@chem.washington.edu

PROJECT OVERVIEW:

In the fall of 1993, the University of Washington (UW) Department of Chemistry received the first of three one-year grants that totaled $205,321 to provide four week summer institutes for 10 high school and 10 pre-service (students who are pursuing a Master's of Education and teaching certificate) teachers of Native American students. The goal was to update teacher's chemistry skills and to integrate chemistry labs and computerized curriculum techniques with training in tribal learning styles and cultural characteristics. The program would also link teachers and university staff through e-mail, establish weekend teacher workshops for follow-up and evaluation activities, provide on-site chemistry demonstrations and community meetings, improve the preparation of Indian students in their high school programs for the UW or other post-secondary options, and, by working with tribal educators and elders, build bridges of understanding and appreciation of each others' knowledge in order to provide the basis for an on-going commitment to science education.

PURPOSE:

The proposed program for high school teachers and science education majors was designed to improve the preparation of students in the pipeline for post-secondary education. The ultimate goal was to increase the participation of American Indians and Native Alaskans in chemistry programs at the University level, and in science-related careers by providing a comprehensive program of teacher and pre-teacher education, cultural awareness, classwork keyed to tribal needs, ongoing corporate mentorship and tangible, measurable projects in the tribal communities.

BACKGROUND AND ORIGINS:

The four major issues addressed by the FIPSE proposal were: 1) inadequate chemistry preparation of high school and pre-service teachers; 2) teachers' lack of awareness of Native American cultures; 3) the high turnover rate of teachers in schools that serve Native American students; and 4) the lack of Native American students in the sciences at the university level.

Two correlated factors impede the successful teaching of chemistry at the high school level. First: high school chemistry teachers often have a major in biology and have chemistry as a secondary endorsement on their certificate or have no chemistry endorsement. In order to earn the chemistry endorsement they only need to take the most basic college chemistry courses. Second: those basic college chemistry courses are traditionally taught as large teacher-centered lectures and labs which provide a basic understanding of chemistry but which seldom relate chemistry to real world experiences and concerns of students. Thus, high school teachers, with little knowledge of chemistry beyond the introductory level, tend to replicate this teacher-centered, lecture/lab model. This method of instruction is inappropriate for Native American students whose culture takes a more person-to-person, experiential approach to education. This proposal supported the instruction of teachers and pre-service teachers in chemistry in the context of relevant environmental concerns.

Most teachers of Native American students are Anglo-American. They do not have a background of working with or teaching Indian students. Most have had little or no training in the history, culture or specific learning styles of Native American students. They have little understanding of the roles of tribal councils, elders and extended families in the education of Native young people. In order to successfully teach Native American students and to create chemistry lessons which are relevant to their students, it is imperative that teachers understand basic chemistry they must also understand the communities within which they are working. This program attempted to integrate instruction on Native American culture, history and tribal concerns with the chemistry instruction.

According to information from the UW American Indian Studies Center, the teacher turnover rate in schools servicing Indian students is exceedingly high due to factors such as poor working conditions, cultural barriers and isolation. In order to provide a stable learning environment for the Native American students, there must be some stability to the educational personnel in their schools. The institute sought to build on-going support groups within the schools and between the schools and the University.

American Indians and Native Alaskans are severely underrepresented in undergraduate and graduate programs in chemistry and related sciences at the university level. Although almost 2% of the population of the state of Washington is American Indian, there were none among the almost 3,000 freshmen taking chemistry at the UW during the 1991-92 school year. At the time of the inception of this program, there was no program at the UW or at Washington State University directed toward the particular needs and issues related to increasing the participation of these ethnic groups in the sciences.

PROJECT DESCRIPTION:

This project was highly leveraged by grants from the National Science Foundation, The Educational Foundation of America, ASSIST, GTE, the Corporation for National Service, Eisenhower Math and Science Act, and numerous additional funders to provide scholarships and program support for middle school science teachers, Native American para-professionals, and Native American high school students. The University of Washington provided space and equipment from the Department of Chemistry, a graduate student from the Graduate School of Public Affairs and faculty and staff from many departments to support the project. The first year of the program included 43 participants. Fifty-seven participated in the second year of the program and 28 in the third year. Four participants repeated in the second year and three in the third. In addition to program participants, NASON employed university students as Native American teaching assistants each year. The second summer institute benefited from the efforts of four pre-service teachers from the College of Education who were given responsibility for creating and teaching blocks of the curricula.

Although program content and delivery varied greatly from year to year, each summer institute was built around the theme of environmental science. The Native American concept of the circle of life formed the basis for the first institute. The second summer curricula was based on a simulation which involved the real problem of diminishing returns of sockeye salmon on a local river. Exercises were developed which gave participants some skills to assess the problem as teams and propose creative solutions. The last summer institute expanded on successful strategies from the previous institutes and allowed a more intensified the focus on the science behind environmental issues. This approach attempted to engender a confidence and enthusiasm for science among the teachers and teach them specific educational strategies to use in the classroom and, particularly, in the chemistry laboratory with their students.

At fall and winter retreats participants were encouraged to share information about specific projects and changes in their schools that were happening because of their involvement with NASON. Several students had the opportunity for post-program internships with local corporate sponsors. Native American Teaching Assistants attended National Indian Education Association and American Indian Science and Engineering Society national conferences and the Washington State Indian Education Association conference one year.

EVALUATION/PROJECT RESULTS:

The Outreach Program For High School And Pre-Service Science Teachers Of Native American Students, now commonly known as the Native American Science Outreach Network (NASON), was funded as a model program, with the goal that it would be replicated at other sites. To the end of educating both the program participants and the broader community, extensive resource materials were created. Curriculum and Resource Guides were produced annually. The Resource Guide to the Tribes of Washington was translated to CD-ROM with the addition of video and photos which were provided by the tribes. Forms and evaluation questionnaires produced by the program are included in this appendix and may be reproduced by others. Currently, the Resource and Curriculum Guides and the CD-ROM may be purchased from the NASON program at cost.

The program was successful in reaching many of its goals. Evaluation reports from an independent evaluator are part of the appendices to this report. Many people who appeared science averse at the beginning of the institutes clearly replaced fear with enthusiasm and varying levels of skill. By the very fact of living together, much cross-cultural communication took place. In the third year we were the most successful in recruiting a variety of Native American speakers to participate in the program, beginning with a traditional blessing of the institute on the first day and continued throughout the program with Native American speakers giving their perspectives on topics which spanned the ranged from environmental concerns to cultural stereotypes.

Significantly, several of the para-professionals that participated in the program decided to pursue their BA. degrees and enter into teaching careers. Students, who initially seemed unclear about their academic goals or how to achieve them, frequently developed a commitment to coming to the university. Two students who completed the NASON program spent the summer prior to their freshman year at the UW in a bridge program working at the Jet Propulsion Laboratory in Pasadena, CA and studying calculus. Both are now doing well in their first quarter as UW freshmen. A third NASON student majoring in the sciences is also a UW freshman this year.

Although this grant was initially to support pre-service teachers as well as high school teachers, from the first group of participants it became immediately clear that, even with fine intentions, pre-service teachers were unlikely to serve Native American communities. Subsequently the program shifted to support Native American para-professionals, people with AA degrees already working in the schools who have the potential to become certified teachers and who will stay with their communities. This strategy worked very well. It is hard to say what the effect was on the non-Native teachers. Many reported achieving tremendous insights into their students and their own teaching styles over the course of the institutes. The most difficult aspect was to get the teachers and students to mix, the natural tendency was for each group to seek out their own. Strategies used during the institute to overcome this natural tendency were assigning lab partners which mixed students and teachers and to assign teacher mentors to particular students for projects. More follow-up assessment is needed to determine long term impacts on the non-Native teachers. Native American teachers improved their skill and confidence in science and served as exceptional on-site resources in all of the institutes. The small size of the third year program reflected the expiration of the NSF grant which supported part of the NASON program.

SUMMARY AND CONCLUSIONS:

The Native American Science Outreach Network addressed major problems which still acutely affect Indian students wherever they may be receiving their education. Although we could not claim to have created scientists among these participants, nearly everyone's comfort level with science definitely increased. Teachers frequently became more aware of students as individuals which may have helped them treat their own students with less stereotypical expectations. More research needs to be done to see if this is so. Because teachers and para-professionals were all adults, the line between the roles frequently blurred. Non-Native teachers often looked to their Native American counterparts as resources for traditional Native American scientific understanding as well as cultural interpretation.

A continuation grant proposal has been submitted to NSF by Dr. Selfe.

FIPSE

OUTREACH PROGRAM FOR HIGH SCHOOL AND PRE-SERVICE SCIENCE TEACHERS OF NATIVE AMERICAN STUDENTS

1993-1996

PROJECT OVERVIEW

The Native American Science Outreach Network (NASON) was conceived as a way to prepare Native American students to succeed in the sciences at the university level through better preparation of their teachers in teaching science and working with Native American students. Recognizing that Native American communities are faced with increasingly complex problems which require scientific expertise, and recognizing that currently most of that expertise is coming from non-Native consultants, we resolved to work with teachers of Native American students to both augment their science skills and their ability to work positively and sensitively within the Native American communities from which their students come. Understanding that everyone learns better with immediate feedback, we decided that teachers would learn better if they were immersed in an environment which not only encouraged them to do better in science, but which forced them to test the reality of their assumptions and stereotypes about Indians by actually living with and studying with Native American students, para-professionals, and university teaching assistants. The same would hold true for assumptions and stereotypes held about teachers by the student community. It was determined that one month summer institutes, where all participants lived and studied together, would provide an excellent format for meeting the goals.

Over the course of three summers we experimented with various pedagogies, content , and numbers and mix of participants in the institutes. Thirty-one adults and 12 students came the first year; 33 adults and 24 students the second; and 16 adults and 12 students the third year. Four participants and three staff repeated from year one to year two. Three participants and three staff repeated from year two to year three. Dr. Selfe and Ms. Little were with the program all three years. Native American university students acted as Teaching Assistants each summer. The second year, four students from the UW College of Education assisted with science education

components. Several students were placed in corporate settings after each institute. Participants were encouraged to implement community service projects during the school year and an effort was made to connect participants on the Internet as well. Each fall and spring, follow-up weekend workshops were held to share what was happening in schools and communities and to make suggestions for the ensuing program. These workshops were not required for participants to receive academic credit. Each fall the Principal Investigator and several staff traveled to many participating schools to do chemistry demonstrations, meet with school teachers and staff to better acquaint them with the University of Washington and the NASON program, and to meet with Native American students to encourage them to prepare for post-secondary education.

Despite major variations in content and pedagogy in each of the institutes, all the institutes apparently resulted in some measure of success in teaching science, overcoming barriers to including science education in the classrooms, breaking down stereotypes, providing teachers with concrete tools to use with Native American students and tribal communities and encouraging students to continue in school and pursue post-secondary degrees in science or science-related careers. We can perhaps conclude from this the very fact of bringing people together in a safe environment, presenting them with scientific challenges to overcome as teams, and supporting them with positive university student role models and enthusiastic faculty is more important than any specific content (i.e., it doesn't matter whether its chemistry or biology). Although most of the students are still in high school, three who have graduated are currently at the UW, intending to major in the sciences. It would be beneficial to do a follow-up evaluation with teachers in their schools and communities to determine the impact of the program in the classrooms and communities.

PURPOSE

Several issues combine to support the need for a comprehensive regional initiative directed towards Native American populations. They include resource management matters, severe under-representation in the science based professions, remarkably high teacher turnover rates in isolated

regions and the need for leadership within tribal communities that is skilled at cross-cultural interactions.

For decades Pacific Northwest Native Americans have been at the center of negotiations over the use of resources guaranteed by treaties. In order to effectively address these and other critical issues, the communities need a well educated population with leaders who understand the scientific bases of the issues in question.

Native Americans continue to be the most underrepresented minority in the scientific and technical professions. Only about 52% of Indian students nationwide graduate from high school; 17% enter college. Only about 0.4% of the degrees conferred by institutions of higher education were awarded to Native Americans. Even if they go on to college, they are unlikely to major in science or mathematics. At the beginning of the program, a survey of enrollments at the University of Washington revealed that although almost 2% of the population of the State of Washington was Native American, yet, none could be identified among the almost 3,000 freshmen taking chemistry, none were majoring in chemistry or biochemistry, and none were in the chemistry graduate programs.

The Indian Nations At Risk Task Force of the U.S. Department of Education found that existing educational systems have not effectively met the educational, cultural, economic and social needs of American Indian communities. The Task Force emphasized that improving the quality of teaching, providing a culturally appropriate curriculum, and implementing partnerships between schools, universities, and their communities are priorities for the future. Poor working conditions, cultural barriers and isolation contributed to the extremely high turnover rate among teachers at schools with high Native American populations.

New ways must be found to relate science to Native American special interests. Leadership training and service projects are needed to encourage students and teachers to directly influence their own environment in order to introduce positive attitudes toward chemistry and the other sciences in the students and provide a much needed support group for the teachers within the

community. Students, community leaders, teachers and community corporations must work cross-generationally on common problems.

With these problems in mind and considering the resources we had available to address the issues, the purposes of the NASON program and the mechanisms to achieve the purposes, as stated in the original proposal, were to:

1) Update chemistry skills of high school teachers of Native American students and pre-service teachers; and

2) integrate chemistry labs and computerized curriculum and communication techniques with training in differential learning styles and cultural characteristics of each Native American tribe with which we are working.

BACKGROUND AND ORIGINS

Careers in science presume a strong foundation in math and the sciences, a foundation which is difficult to lay once a student enters college. Unless teachers can both teach accurate basic skills and encourage their students to enter the sciences, it seems unlikely that any significant numbers of Indian students will be prepared to fill essential scientific roles in their communities.

The University of Washington is a large (34,000) research institution located in urban Seattle on the shores of Puget Sound. The state is home to 27 federally recognized Indian tribes and six non-federally-recognized tribes. The Indian population in the state was 1.87% in the last census with people living here who represent many of the tribes in the United States. Tribal populations are divided into coastal tribes on the west side of the Cascade Mountain Range, typified by small reservations, small tribal populations, and historically, much mixing with non-Native people. On the east side of the mountains, the Plateau tribes have much larger reservations and indigenous populations. Often living in remote geographical areas, historically they had much less contact with settlers than the tribes to the west and they remain somewhat more isolated today.

The project began with an assessment of numbers of Alaskan Native and American Indian students in the chemistry program at the University of Washington to see if there was a need for a graduate program directed specifically at that population. After discovering that there were no

students in the approximately 3,000 undergraduates taking chemistry, we realized that there was a rupture in the pipeline that needed to be fixed. A proposal was submitted to the National Science Foundation to fund summer institutes for middle school science teachers of Native American students. Recognizing that even if students were better prepared at the middle school level, without a focus on high school teachers, they were likely to fall through the cracks when they returned to negative classroom experiences in their high school years. Therefore, we submitted a proposal to FIPSE to include high school and pre-service teachers in the summer institutes. (Pre-service teachers are students in the College of Education who are seeking teacher certification through a Masters in Education program.)

We realized that teachers could be better prepared with improved science curriculum, but a more valuable experience would be if they could work with students to get immediate feedback on curricular ideas and ways of dealing appropriately with Indian students in the classroom. Other benefits of adding students included exposing them to campus life, upgrading their science skills, increasing their comfort level and ability to communicate with teachers, and having them live with university teaching assistants who are proud of their heritage and confident of their academic abilities. Because we had difficulty recruiting pre-service teachers, we realized rather late in the spring prior to the first institute that Native American para-professionals would provide a needed bridge to enable participants to interact with each other and that they would be more appropriate people to train than pre-service teachers. (Para-professionals are people with 2 year Associate Arts degrees who assist in classrooms.) We saw all the participants as partners in the learning and teaching processes, each with very definite skills and insights to offer the others. By leveling the playing field and removing some of the standard hierarchies and assumptions that hold sway in schools, we hoped to encourage participants to see each other as partners in the educational process instead of barriers to each others' progress.

Because students and para-professionals were not added to the matrix until after the NSF and FIPSE grants were secured, a great deal of time was spent in fundraising and recruiting the participants that spring.

PROGRAM DESCRIPTION

SUMMER INSTITUTES: During the course of the grant, the Chemistry department held three NASON summer institutes. As each summer institute varied considerably from the others, both in numbers and demographics of participants, hypotheses driving the curriculum, and program content, the goals will be addressed in light of Summer 1 (1994), Summer 2 (1995) and Summer 3 (1996) in order to provide clearer insight for others who may attempt such a program. All of the institutes featured one group field trip each week. A brief summary of each of those institutes is followed by an analysis of how each institute addressed the goals and intended methods of the grant.

SUMMER 1: 1994

Participants: 25 Teachers: HS (7 Non-Native, 2 Native American); MS (12 Non-Native, 1 Native American) ; Pre-Service (2 Native American, 1 Non-Native)

6 Para-professionals: 5 Native American, 1 Non-Native American

12 High School Students: 3 F, 9 M

12 Staff: Dr. Selfe, Ms. Little, 3 lead teachers (1 NA), 2 NA university student Teaching Assistants, 4 undergraduate students, 1 graduate Teaching Assistant

Hypothesis: Traditional science lectures and laboratories, devoid of any meaningful relationship to Native American concerns and taught by teachers with little understanding of Native American history or culture, discourage potential Native American science students. By using environmental science as a vehicle to address broader cultural concerns, we can generate an interest in science, develop facility with scientific processes, and address factors identified by the Native American community as critical for teachers to understand if they are to successfully teach Native American students. Combining environmental science with training in cross-cultural communication, histories and cultures of Washington tribes, and current Indian issues will enable teachers to work meaningfully and successfully with students and tribal communities.

Content: The concept of the circle of life formed the basis for the first institute, beginning with water as a chemical, ascertaining its "health" with water monitoring. Wetlands and ethnobotany, which focused on Native American uses of plants in the Pacific Northwest, lead to analyzing nutritive values of food. Toxicology of alcohol and tobacco covered harmful effects on the body. The circle closed in the fourth week by studying water as a cleansing agent and a source of energy.

At least two afternoons each week and many evenings were spent on cross-cultural activities and probing Native American issues as explained below. Most of the first day was spent on opening ceremonies, with elders presenting their views on the importance of education and university students adding their perspectives followed by activities to integrate western and Native American concepts of science and holistic education. The institute ended with a graduation and giveaway organized by Indian participants.

GOALS TO ACTUAL:

Chemistry skills were updated through classes and hands-on experiences with water sampling and testing, acid/base properties , the different states of matter, analysis of the periodic table of the elements, using plant materials for dyes, chromatography, microscale synthesis of flavorings, nutrition laboratories, toxicology, alcohol curriculum, and using water as an energy resource. Although time was spent on environmental science, the principal investigator was concerned that the institute was not grounded enough in science - too many topics were covered with not enough depth of knowledge for the teachers or the students to gain confidence in any one area. Post-tests did not show a significant improvement in science knowledge, and the homework and curricula that teachers prepared were generally dismal.

A great deal of time was spent on learning styles and cultural characteristics of the tribes. We began by linking Native American and western concepts of science through an activity on structures, then analyzing the activity through discussion about how the activity incorporated techniques appropriate to both Native American and western scientific investigation. After a

member of the Makah tribe taught about learning styles and history, we energetically related our new knowledge to the Gardner's Seven Intelligence's. Using an active process of sorting through alternatives, we linked water testing with concerns and needs in tribal communities. Many sessions were spent on multi-ethnic education and how to reach students with much sharing by all the participants as we went through various group curriculum planning activities and candid, often painful appraisals of how schools really (don't) work for Indian students. There were hands-on sessions on holistic integration of art, music and stories, a review of the Boldt fishing decision with personal stories of individual and family involvement in that fractious controversy, a Cowlitz speaker on Fetal Alcohol Syndrome and Fetal Alcohol Effect followed by candid (again painful) small group discussions on many ways that alcohol affects students in schools and communities, major discussions on building whole communities, a session on evaluating textbooks from a multi-cultural perspective, and a presentation by the Northwest Indian Fisheries commission.

Many campus and community resources were involved in the summer institute, although not everyone we planned on including was available. Professor James Nason, *Comanche*, spoke about Indian art and museology, with special emphasis on the Repatriation Act and the science involved in preservation of artifacts. Professor Eugene Hunn presented information on traditional ecological knowledge and led an ethnobotany outing to the UW Arboretum. Outside resources included Donna Scott, *Makah*, on learning styles and history; Leonard Foresman, *Suquamish*, Marie Ruby, and Astrida Onat, archeologists, guided our learning at the Cedar River watershed; Robin LaDue, a *Cowlitz* psychologist , gave a presentation on Fetal Alcohol Syndrome and Fetal Alcohol Effect; Jeannette Allen, *Nez Perce*, directed group interactions on the alcohol theme, and a speaker from the Northwest Indian Fisheries Commission brought us up to date on their work.

The *NASON Resource Guide*, which had been developed prior to the institute, provided a strong basis for cross-cultural discussions and developing understanding. Although a specific emphasis was put on computer training, we found it very difficult to meet the range of needs of the participants. Some people didn't know where the "on" switch was located; others were experienced Internet researchers. By the end of the institute, everyone showed a level of facility

with email and some skill at word processing. However, we were not satisfied with the level of progress. Laboratory experiments, while somewhat successful, also suffered from the wide range of experience and expertise that the participants brought to the program. Some participants were science phobic; most had no idea of how to keep a lab notebook; students regularly outstripped the teachers in complexity of problems attempted and accuracy of results achieved. We felt that our pre-assessment of science needs did not provide enough information to accurately meet participant's needs. Teachers were required to create several lesson plans which integrated cross-cultural concerns with experiential science lessons. For the most part, these lessons showed little creativity or comprehension of the scientific concepts presented. The process of "how to do science" was completely lacking from the lessons.

Despite the generally dismal academic showing, particularly of the teachers, real progress was made toward reaching cross-cultural program goals. Students, who had never been to the university, left feeling that they belong here. Many changed their curriculum when they returned to high school in order to take college prep courses. Two of the 12 original students are now freshmen at the UW, intending to major in the sciences. One para-professional is currently at the UW, completing an undergraduate degree in art with the goal of becoming a teacher. Another para-professional graduated from the UW and is currently pursuing her teaching certificate. A Native American high school teacher is now the Superintendent of the Muckleshoot Tribal School after serving two years as Principal of the Quileute Tribal School, a job he secured while at the NASON summer institute. Most of the non-Native teachers reported that the NASON experience made a major change in their approach to teaching all students, but especially Native American students.

SUMMER 2: 1995

57 Participants: 25 Teachers: HS (3 Non-Native, 1 Native American); MS (13 Non-Native, 4 Native American); Pre-Service (4 Non-Native College of Ed students who also taught)

8 Native American Para-professionals

24 High School Students: 12 F, 12 M

18 Staff: Dr. Selfe, Ms. Little, 2 lead teachers, 6 NA university students, 4 College of Education students (also counted above as participants), 3 undergraduate students, 1 administrative assistant.

Hypothesis: Many Northwest tribes are concerned with watershed and fish. By identifying one problem and building the entire curriculum on that problem, many scientific processes, techniques and teaching approaches can be illustrated and adapted to studying one issue. By developing a curriculum around one issue the teachers would get experience with how to develop a curriculum based on an issue of importance in their own community. Teachers should be able to apply this process of problem solving in their classrooms. College of Education students would benefit from hands-on teaching experience with target populations in a situation that provided for immediate feedback from students, teachers and their peers. By working in flexible small groups, particularly with guidance from Native American university students, teachers and students could address cross-cultural issues in the context of an educational format. Para-professionals would provide much needed cross-cultural bridging for all parties concerned.

Content: Participants were challenged to address the issue of decreasing numbers of sockeye salmon returning to the Cedar River near Seattle. In the mornings they learned laboratories relevant to water testing and analysis. Afternoon sessions, organized and taught by the College of Education students, presented various scientific concepts (watershed issues, life-cycle of the salmon, pollution effect, etc) in terms of "jigsaws", an instructional technique designed to encourage teamwork and group interaction. During the last two weeks, teams applied their new skills to addressing the problem, coming up with "solutions", and presenting their ideas to the whole group.

GOALS TO ACTUAL:

Prior to the 1995 institute, with the help of tribal leaders and educators, including extensive editorial review by the tribes and Ms. Little, the *NASON Resource Guide* was almost doubled in

size by Michael Kern, a student in the Graduate School of Public Affairs. Participants were encouraged especially to read and discuss parts related to schools, attitudes, and teaching and learning styles. Mr. Kern also converted the *Resource Guide* to CD-ROM which enabled both participants and many others to have access to basic information plus videos and photos supplied by the tribes.

Because the expertise of the chemistry department is obviously in science, the principal investigator decided that the most important thing that we could offer to prepare Indian students to succeed in the sciences was to teach them and their teachers environmental science in a more rigorous manner. Environmental science was a much stronger focus in the second summer institute. The stage was set for integrating indigenous and western science early in the program. A panel of representatives from Indian Fisheries and the Seattle Water Department framed the context of the sockeye salmon simulation problem which was then related to the "fish kill" problem in the *Chemistry in the Community* textbook. During the first two weeks College of Education students set up jigsaw experiences based on constructivist education theory in which participants were divided into small groups. One member of each group learned a specific experiment needed to address their problem, then they each returned to their original group and taught each other the sections of the "jigsaw", constructing the puzzle until everyone in each group understood how to set up an experiment to address the whole issue.

Lead teachers spent the mornings in weeks two and three teaching nuts and bolts science: how to keep lab notebooks, make conductivity testers, create density columns, water testing, learning about acids and bases, learning about solvents, construct spectrum boxes, understand semi-permeable membranes, and decorate clothes and shoes using chromatography. During the afternoons of the third and fourth weeks, participant groups worked independently, using staff as resources, to address the sockeye problem and prepare final presentations to the whole group at the end of the program. Most of the last week was spent on project preparation and presentations. Portfolios kept for each participant allowed faculty to see the range of work each person completed over the month and allowed participants to have some control over how they were evaluated. This

worked reasonably well. As expected, those students who failed to engage in the institute activities had little or nothing to show in their portfolios and subsequently received no credit for the institute. Many portfolios showed excellent, creative work

Academic activities were generally well received; four of the six students who graduated from high school in the spring of 1996 continued on to post-secondary education, three at the UW majoring in science and engineering. (Two of the three participated in both the 1994 and 1995 NASON institutes.) Two para-professionals are continuing their college education and a third is enrolled in a teacher education program. Without further research it is difficult to measure the impact of the summer institute on the teachers.

Program goals in the second year were shifted to emphasize science in the formal aspects of the program and generally address the cross-cultural training informally. Native American teaching assistants and participants worked around the edges on cross-cultural issues. Small groups of students met regularly with a TA graduate student in history to hone library and writing skills or work in the computer labs. One of the participants began most mornings by telling a story from his Quileute tradition. Some evenings and rest times were spent making crafts, viewing videos, and learning about opportunities for Native American students. Cultural activities included the opening program in which elders shared their personal stories and encouragement for the students to make the most of educational opportunities, a discussion on a Western vs. Native view of science, a wonderful afternoon with *Spokane* author, Sherman Alexie, and afternoon sessions on the University of Washington Office of Minority Affairs (OMA) and cultural exchange (by a first year teaching assistant). Despite the lack of the formal inclusion of cross-cultural training, many participants communicated what they felt others needed to know. Some participants and staff voiced strong objections that the institute did not focus enough on Native American concerns. While other participants and staff were just as adamant that science had taken a back seat to cultural issues. Finding a balance between cultural instruction and science instruction was the most challenging aspect of the program. In year three another format was attempted to try to address this issue.

SUMMER 3: 1996

28 Participants: 15 Teachers: HS (5 Non-Native, 3 Native American); MS (7 Non-Native)

1 Native American Para-professional

12 High School Students: 11 F, 1 M

8 Staff: Dr. Selfe, Ms. Little, 1 NA lead teacher, 3 NA university students, 2 undergraduate students.

Hypothesis: To appropriately address both the cultural issues and the scientific instruction there needs to be an integration of the two as much as possible throughout the institute. While teachers need to upgrade their chemistry skills in order to effectively prepare students, the lessons need to be presented within the context of an issues of import to Native Americans. The goal is to not only encouraging teachers to feel "at home" with chemistry lectures and laboratories, so that they will put a positive face on science and will incorporate science in their classrooms but to also show them that chemistry and science is important to their students and communities. By providing examples of the integration of science and cultural the teachers will learn by example. During the institute the teachers will also present "lessons" to the entire group, this way they will be able to practice their own skills and see how others present engaging lessons.

Native American faculty and staff were resolute that students need to know how to survive in the real world of college science classes: lectures and laboratories. They need to know how to take notes, create lab notebooks and distill important information. Therefore examples of typical science lectures were provided for both teachers and students. A science fair for the students would provide an opportunity for students to creatively put their skills to work and allow the teachers to act and mentors working one-on-one with the students on science projects.

Content: Participants spent most of their time on basic chemistry concepts and how they related to various environmental issues. The focus was on developing skills that could be translated to classrooms and provide a foundation for students to succeed. Lectures and laboratories generally focused on water chemistry and understanding watersheds. Presentations by

the staff would use a variety of teaching methods: lecturing, hands-on, group activities, jigsaw, etc. Teachers prepared lessons to teach to all participants and students created science fair projects that were presented on the penultimate day.

GOALS TO ACTUAL:

As with prior institutes, the emphasis was on environmental chemistry with a focus on watershed issues. Dr. Selfe set the stage discussing watersheds and the variety of tribal issues which are impacted by watershed issues. Charlene Poste, *Squaxin Island*, discussed the cultural significance of environmental stewardship which was followed by small groups visiting the Puget Sound model in Oceanography and viewing a video on an archeological site which was the focus of the field trip for the week. Preparing participants for extensive lab work, Dr. Selfe taught a class on laboratory safety and keeping a lab notebook. Dr. Selfe and lead teacher John Brewer, taught additional classes on water structure, properties and uses, making sparklers, building density columns and experimenting with Coke and Diet Coke, making conductivity testers, the periodic table, ions, polarity and solubility, ink chromatography, acid/base chemistry, jigsaws, water testing kits, spectroscopy, groundwater, a groundwater simulation that could be used in schools, foul water, chloride titration, and finding out how much fat in a hot dog and other fun chemistry experiments. We were exceedingly lucky to have John Brewer, Oglala Sioux, join our staff for the third year. He was an invaluable resource on both cultural and science issues. Wherever possible Native American issues were integrated with the instruction. One example would be the discussion on groundwater. The topic was introduced by members of the Suquamish Tribal Natural Resource Department where brought maps of the reservation and talked about the various groundwater problems that exist on the reservation. In addition they brought their groundwater model and automatic water testing equipment for the participants to see and use. This was followed by a group activity where a map of a reservation was given to the participants which showed that a recent well has been tested and found to be contaminated. Each group needed to

decide where they would dig test well in order to determine the source of the activity. It was an excellent example of integration which was followed by a discussion led by Mr. Brewer where he talked about just such an incident on his reservation where the wells had been contaminated by a leaking gas tank. The concept of density was framed with the context of building canoes, discussion on acid/base properties was followed by making Indian Fry Bread, etc.

Each teacher, alone or in small groups, presented a lesson to all the other participants. Students "graded" these lessons, giving helpful feedback on what really works. Teachers spent most afternoons in the early part of the institute creating their lessons and most afternoons in the last weeks presenting them to the group. Unlike year one where we had teacher prepare several lesson plans, in year three the teachers prepared one less and the results were excellent. Several of the lessons were wonderful integrations of cultural and science. For example, one teacher made a presentation on how native people have used science to convert foods of low or no nutrition into "Superfoods", this presentation was followed by a lab where the participants (and the staff) made tofu - an excellent example of extraction, solubility and precipitation. Another group of teachers presented a lesson glaciers which was introduced with Native American legends and music. During the teacher's lesson preparation time, students were supposed to be working on their science fair projects. It wasn't until the teacher's had finished their preparatory work that they were able to mentor the students and thus most work on the projects was delayed until shortly before the science fair.

At the beginning of the institute Dr. Selfe laid out clear goals and expectations for the participants in order for them to get credit for being there. These related to attendance, participation, preparation of materials and large group presentations. Small groups performed experiments together in the labs, ensuring some cross-age and cross-cultural communication. The TAs were constantly consulted to determine how the groups were working together this way we were able to insure that their was a constant mixing of various ages and skill levels during the institute.

In addition Native American issues which related to science several Indians made programmatic presentations on other cultural issues. Harold Belmont, an elder of the Suquamish Tribe opened the institute with a traditional blessing. As stated before, Charlene Poste, *Squaxin Island*, spoke on the Cultural Significance of Environmental Stewardship and Leonard Foresman, *Suquamish*, presented archeological information.. Evening activities included graduate student Anneliese Traume, *Pima*, presenting on the Native American Barbie doll which led to an excellent discussion of cultural stereotypes, Wesley Thomas, *Navajo*, speaking about Navajo weaving and his experiences as a child in boarding schools, and representatives from the UW Office of Minority Affairs talking about college entrance to the students. On one occasion the whole group discussed experiences of racism and stereotyping in the schools and another time teachers spent an hour and a half talking about what really happens in their schools and how they create supportive, academically challenging environments in their classrooms. The *NASON Resource Guides* were given to all participants.

EMAIL CONNECTIONS: Although we intended to connect all teachers by email, we could find funds only to pay for modems. Over the course of the three years, many more school districts came on-line, however only 17 of the total participants are now linked on e-mail. It seems that this problem will be resolved soon as the Washington legislature has allocated funding to bring all schools in the state on line.

WEEKEND RETREATS Fall and spring retreats were held for the first two groups of participants and a fall retreat for the third. People were not required to attend. Programs included time for people to share what they have been doing in their classrooms, specific service projects they have been doing with the community, successes and challenges in their schools, additional computer training and a trip to see Pocohontas with pre- and post-discussions of the movie and broader issues of stereotyping. Attendance proved much stronger at fall retreats than spring

retreats. The final fall retreat, which was to be held off-campus at Pack Forest in November 1996 was canceled due to inclement weather.

STUDENTS IN THE PIPELINE: The NASON program appears to be somewhat successful in repairing some leaks to the pipeline. Of the 12 students in the first institute, three are now at a university (2 at UW), three in community college, four in high school, one dropped out after a family tragedy, and one went to jail. Of the 19 new students in the second institute (3 repeated from year 1) one is at the UW, one in community college, one in the Army, one dropped out and 15 are still in high school. All of the third year students are still in high school. Most of the high school students assure us that they are still on track for going to college.

Equally important, one para-pro from each of the first and second year programs have now graduated from college and are in Masters in Teaching programs; and one para-pro each from years one and two is currently pursuing an undergraduate degree.

COMMUNITY CONNECTIONS: The NASON program was highly successful in attracting community support. In addition to major federal grants from the National Science Foundation, FIPSE and the Corporation for National Service, NASON received specific scholarship support from the Educational Foundation of American, the Bureau of Indian Affairs, the Eisenhower Mathematics and Science Act, and ASSIST (a sub-grant from another NSF project). Local support, both financial and in-kind, came from Apple Computer, Battelle Northwest, Bonneville Power Administration, Bristol-Myers Squibb, GTE, the Hubert G. Locke Fellowship for Social Justice, IBM, King County Water Pollution Control, the Lummi Tribe, Puget Sound Power and Light Company, the Puget Sound Water Quality Authority, the Quinault Tribe, the Seattle Water Department and the Snohomish County Public Utility District.

In addition to financial and in-kind support, the Snohomish County PUD and the Colville Tribe provided paid internships for students from their areas who attended the NASON institutes. Battelle anticipates hiring NASON students from the 1996 program into summer positions in 1997.

These students immediately were able to apply skills that they learned in NASON to work situations as well as establish excellent networking contacts with companies which need to work closely with the tribes.

The University of Washington provided space for program staff and laboratories and equipment for participants to use. Michael Kern from the Graduate School of Public Affairs received two awards for his Master's degree project, The Tribes of Washington CD-ROM, which was also the basis for the NASON Resource Guide. Many faculty, particularly from American Indian Studies and Anthropology, assisted with the program. Office of Minority Affairs staff provide support in recruiting, funding, and joined in specific activities.

One part of the program, which seemed somewhat peripheral at first, became a very important piece of the community connections. Each fall Dr. Selfe and a varying number of Teaching Assistants and undergraduate students traveled to many of the schools that had participants in the program. These trips lasted two weeks during the first two years. Dr. Selfe gave chemistry demonstrations to hundreds of students and teachers, sometimes the whole school at once. While undergraduate students gave water monitoring slide presentations to individual classes, the TAs met with counselors, individual teachers and selected groups of students, sharing specific information on college entrance requirements, answering questions, helping to form a Native American club at one school, and encouraging Indian students and their teachers to aim for college. All aspects of these programs met with great success. "Our" students and teachers were thrilled that the UW team came to their schools and a tremendous amount of excellent information was presented at each stop. With limited resources the third year, the trip lasted three days followed several one day trips to communities closer to Seattle. Although the team limited their presentations to science demonstrations by Dr. Selfe, the response was still overwhelmingly positive. In addition to presenting science and college information, these trips showed all the schools and communities that people at the UW do care about Indian students' success in higher education.

EVALUATION/ PROJECT RESULTS:

Evaluation measures established at the beginning of the project sought to assess the impact of the program in the schools and communities from which our participants came. This invariably calls for long term research with a great deal of time spent in the communities and schools, interviewing, observing and gathering data. Ms. Little will be doing that extensive, on-site research as the focus of her Ph.D. thesis in anthropology over the course of the next year.

More realistic assessment is confined to the institutes and the program itself. Although certainly the NASON program would not presume to take full credit for all positive outcomes, some facts are worth repeating. In the fall of 1996 Indian enrollment reached an all time high at the University of Washington, 120 versus 87 for the prior year. There are now three NASON students majoring in the sciences in the current freshman class. All but one of the Native American para-professionals who participated in NASON are either still working with Indian students or are pursing post-secondary or graduate degrees. All but three of the middle and high school teachers are still working either in Indian schools or with Indian students.

Outside evaluations were prepared for years 2 and 3. Those reports are in the appendices. Unfortunately, the post-tests for both summers were interrupted by unforeseen events (the latter a bomb scare when they were halfway through), which resulted in less than optimal evaluations for the reviewers.

SUMMARY AND CONCLUSIONS:

We have gained many insights as a result of doing this project. Our understanding of the problems was naive at best. Although all of the initial statements about needs and problems to be addressed were correct, we did not understand several key points.

- 1) It was very difficult to recruit non-Native teachers even with pay and academic credits, and nearly impossible to recruit pre-service teachers who would not be paid. Teachers who would come to a residential program in the summer were typically young or without family commitments or they needed the continuing education credits.

- 2) Most teachers teach across the curriculum. Particularly in rural schools, they are responsible for many subjects and multiple age groups. Few of them bring a strong background in science which meant that we frequently dealt with science phobia as well as lack of scientific information or expertise, causing faculty to spend a great deal of time and energy on seemingly "unrelated" efforts which were necessary for teachers to even begin to do science work.
- 3) The design of an institute which is to tackle issues of both science and culture is exceedingly difficult. There is constant tension to make sure that both science content and culture issues are addressed. Teachers who feel confident in science want more instruction on cultural issues and teachers who are weak in the area of science want strictly content instruction.

The constant refining of the institute over the course of the three years resulted from the needs to address these issues. While a better balance between science and cultural issues was achieved in year two and three, these years were by no means perfect. Having both middle school and high school teachers in one institute lead to a participant group with a very diverse level of science skills. Future institutes should be restricted to a smaller grade level range so that there is a smaller set of science concepts addressed which will hopefully allow for a balance of cultural issues and science concepts.

APPENDICES:

A: Schedules of each Summer Institute - 1994, 1995, 1996

B: Evaluation Reports - 1995, 1996

Native American Science Outreach Network
(NASON)

APPENDIX A

NASON WEEK 1 Schedule Date July 10-15 Teachers 7/8/94

Date						
	Sunday 10	monday 11	tuesday 12	wednesday 13	thursday 14	friday 15
8:30 a.m			***Johnson 123*** Question Cards, break into 3 Groups, 20 each rotating for one hour introductions to resources:	***Gowen 201 8-12*** QuestionCards	**Meet in front of Haggett at 8:00, 8:30 Leave** for Cedar River Watershed	***J 123*** Question Cards
9am		***Faculty Club 8:00-12*** Introductions	Computer, Michael at HS Computer Lab	Learning Styles, History of Native Americans, Donna Scott, Makah	930A: Arrive at Watershed - Bldg 5- slide show (Celese) and view topigraphical model of watershed (Marie)	Labs - finish water testing
10am		**10:30** ***Faculty Club,*** Elders	Library Resources, Anne Zald	Template, Capacity checklist 15 min break	1030A- Reflection on who WE are, own cultural bases and biases	Finish water testing to **10:30At 1030A** students remain in lab for ICP stuff, teachers will break into groups to attend
11am		Elders, contd	Burke Museum - Jim Nason	7 Intelligences	Discussion continued	two 45 min Mini-sessions Acid/base ***B 133*** States of Matter-***J 119*** Water Monitoring-***J 123***
12		***Waterfront Activities Center11-2,*** Honor Lunch	lunch	lunch	lunch - at Chester Morris Lake, archeology with Astrida Onat, Leonard Foresman and Marie Ruby	lunch
1pm		Honor lunch - cont'd	***J 119, 123*** Chem Comm test	***B 154*** 7 Intelligence Stations	130P - Will start water sampling of lake	***B 154*** Integration of water testing with NA and local concerns/needs, Charette
2pm	check in Haggett dorms	Hands on activity, Structures	***B 154 2:10*** 2-2:30 Attitude test 2:30-3:30 Goal Setting		Explore plantlife and secondary growth forest	Introduction of homework assignment
3pm	administrative stuff, campus tours, welcome students	***3:30 Bagley 154*** Evaluate Relate to NA and	3:30-4:00 Why do this water testing anyway?	2:45-3:45 Small groups Design 7 ways of teaching about salmon using Donna's template	Move to Falls - break into two groups - view falls, penstocks - opportunity to collect more water and plants	Curriculum planning,
4pm-4:30	welcome - in Haggett lounge	Relate to Scientific Method, Feedback cards Bulletin board	Evaluation Question Cards	3:45 - 4:30 share models Feedback with Donna Evaluation, Question Cards	Return to campus Feedback cards on bus	Informal review, snacks
4:30-5pm						

BEST COPY AVAILABLE

NASON WEEK 2 Schedule Date July 18-22 Teachers 7/8/94

	sunday	monday 18	tuesday 19	wednesday 20	thursday 21	friday 22
8:30a.m		***J 123*** Questions Cards, break into curriculum groups	***J 123*** Questions Cards	***J 123*** Questions Cards	***J 123*** Questions Cards	***J 123*** Questions Cards, Mid course corrections
9am		***B 133, J 119, 123*** Meet in groups to go over curricula - select one for presentation	***Walk to Arboretum*** Field Trip - Break into three groups, each group rotates through 1 1/2 hour Stations	Laboratory - using plant materials for dyes, chromotograpy to separate colors and chlorophyll - chemical principle - solubility	***J 123*** Mini-sessions: Periodic Table - making display for classroom	Choice mini sessions: 1 hour each ***J 119*** Grant writing; ***J 123*** plant posters, ***B 133*** microscale ***HS Computer Lab:*** Hypercard
10am		Presentations of curricula	Wetlands	Laboratory	***HS computer lab*** Hypercard	Continue choice time
11am		Presentations	Ethnobotany	Laboratory	***J 119*** Project GREEN	Continue choice time
12		Lunch	lunch	lunch	lunch	lunch
1pm		***J 119*** Rotating one hour Mini-sessions Periodic table games and activities, Anne and Richard	Use of indigenous plants by wildlife	***B 154*** Hands on Science and Art	***B 154*** Multi ethnic education,	***B 154*** Integration of art, music, stories: holistic curriculum
2pm		***J 123*** Poster Project - Sally, Bill L, and Tanya- how to make cheap plant press	continuing on tours	Hands on Science and Art	Simulation on multi ethnic education	Curriculum planning
3pm		***Suzzallo,*** Library Internet instruction, Anne Zald	Wetlands video	Hands on Science and Art	How to reach the kids	Curriculum planning
4pm-4:30		***B 154*** Question cards	Return to campus and do plant pressings May run a little late	Question cards	Cont'd discussion	Informal review, snacks
4:30-5pm	return to dorm, students check in with Deb and Sean					
6pm					DEMO NIGHT - optional attendence but just a bunch of fun demos from the UW	

BEST COPY AVAILABLE

NASON WEEK 3 Schedule Date July 25-29 Teachers 7/8/94

	sunday	monday 25	tuesday 26	wednesday 27	thursday 28	friday 29
8:30a.m		***Haggett Lounge*** Cards	***Haggett Lounge*** ? Cards	***Gowen 201*** ? Cards	***J 123*** ? Cards	***J 123*** ? Cards
9am		***Haggett Lounge*** Meet in groups to go over curricula, build group unit	How to communicate with your students, whole group	Toxicology Speaker FAE/FAS	***B 133*** Laboratory - on nutrition - Fat, sugar, protein, vitamin C - integrate native plants	***B 133*** Introduction of AISES Curriculum Labs with alcohol, chemistry applications
10am		Continue group unit		Personal experience panel	4 labs for teachers to choose from to do	AISES curriculum, labs
11am		Presentations of group units to whole intitute	Field Trip - Blake Island lv. campus at 10:30	***Columns***, Play	Labs	Toxicology curriculum, labs, NIEHS
12		Lunch	lunch	lunch	lunch	lunch
1pm		***B 131*** Debrief labs from last Wednesday	plant sampling geology salt water testing, incorporate NA explanations with western science	Mini Sessions: choose 2 out of 4, 1 1/2 hour each, last 1/2 hour for how to incorporate in school	***1:10 B 154*** Building whole communities	Mini-sessions, choose one: ***J 119*** grants ***HS Lab*** computers ***B 133*** other projects or other labs
2pm		***B 154 2:30- 4:00*** Favorite demos, informal revisions	Eating, dancing, hiking and general exploring	***HS Computing*** computer projects ***J 119*** Grants ***J 123*** Atomic Theory	Discussion of whole communities	***2-3, B 154*** Curriculum development, small groups decide on unit theme, select homework roles.
3pm		to incorporate NA and apply to relevant topics	Cont'd	***B 154*** Incorporating NA into your curriculum and presentation	Toxicology curriculum and computer programs, NIEHS or continue discussion or debrief morning labs, play by car	End of week. This is the Seafair Pow-wow weekend at Discovery Park, through Sunday.
4-4:30		Question cards	Return to campus at 10:30 p.m.	***B 154*** Question cards	Question cards	
4:30-5pm	Return to dorm, students check in with Deb and Sean					
6pm						

NASON WEEK 4 Schedule Date Aug. 1-5 Teachers and Students 7/30/94

Date						
	sunday	monday Aug 1	tuesday Aug 2	wednesday Aug 3	thursday Aug 4	friday Aug 5
8:30a.m		***Haggett Lounge all day*** Question Cards	***8:00 meet at Haggett Hall for 8:30 departure***	***Gowen 201*** Question Cards	***Haggett Lounge*** Question Cards	***J 123*** Question Cards
9am		Meet in groups to go over curricula, build group unit	Field Trip Everett with Snohomish PUD	9-10:30 NW Indian Fish Commission	***Haggett Lounge*** Teachers and students spend morning working on their plans for the school year -	***J 123 and J 119*** Attitude Post-test Program evaluation
10am		Continue group unit	Overview, separate programs for students and teachers until 10:30	1030-12 - Student presentations on research projects	***J 123 and J 119*** Chem Com post test	***J 123*** Finish up any administrative, Packing
11am		Presentations of group units to whole institute	Simulation	Student presentations continued	How are you going to integrate materials from the institute and develop community projects?	Graduation ceremony
12		Lunch	lunch	lunch	lunch	Celebration lunch, *WAC 11-2*
1pm		***Haggett Lounge*** Textbook evaluation	Town meeting in simulation	***1:10, B 154*** Mini-sessions, everyone attend all sessions at once: Tribal and Community resources	***B 154*** Student science presentations	
2pm		***2:00-3:30*** Alternative evaluations in your classroom	Win/win negotiatios, develop plan	Transitions between MS and HS, HS and college	Micro-presentations/discussion of school plans - Do this as school groups	program ends
3pm		***3:30-*** Water as resource, looking at energy	Share plan		cont'd	
4pm			Return from trip, questions on bus		Celebration, Canoe Races	
4:30-5pm	Return to dorm, students check in with Deb and Sean					
6pm						

BEST COPY AVAILABLE

NASON Summer Institute '95 (WEEK 1) July 9-14, 1995 Morning/Afternoon Schedule

	SUNDAY - 9	MONDAY - 10	TUESDAY - 11	WEDNESDAY - 12	THURSDAY - 13	FRIDAY - 14
8:30 am	Breakfast: 7 - 8:30 am daily	(Polaroids taken on entry)	Rotations:	Rotations:	Discovery Park ☆ Daybreak Star leave Haggett entry 8:30	
9am		**Faculty Club** ❒ John Simpson (9:30) ❒ Paul Hopkins (9:45) ❒ James Nason (10:00)	✲ Burke Museum ❒ James Nason	Computer Instruction ◆ Chris Sterling (internet/e-mail) • **Comm. Bldg. - G20**	Predator/Prey (group activity)	Lab Notebooks (first half hour) MS: • **Bagley 108** HS: • **Bagley 260**
10am		Activity: (10:30) ✲ Interviews for Polaroid Pictures	(Switch @ 10:30)	*Intro to the Fish Kill* Chem/Com Book	cont'd	■ Lab: A.2 • *Foul* Water
11am		**Honor Lunch** *Faculty Club - 11:30*	Library Tours ◆ Ned Blackhawk	MS: • **Bagley 108** HS: • **Bagley 260**	Group A: Gayle Gensler METRO presentation Group B: Kirsten\ Botany Walk	(filtration, absorption, separation, integration, & extension)
NOON		**Honor Lunch** cont'd	Lunch	Lunch	Lunch @ 12:30	Lunch
1pm		*Welcome* - Elders ❒ Ted George(12:30) ❒ Emmett Oliver (1:00)	**Panel Presentation** • **Bagley 260** ❒ Rand Little - H_2O ◆ Sara Selfe - C. River ◆ John Schmied - Salmon	**meet @ 12:45** **front of Bagley** ◇ *Simulation* Jigsaw - Mini Sessions	Group A: Kirsten\ Botany Walk Group B: Gayle Gensler METRO presentation	**meet @ 12:45** **front of Bagley** ◇ *Simulation* Jigsaw - Mini Sessions
2pm	✓ check-in @ Haggett **from 2 - 3:15 pm**	❒ Patsy Martin (1:30) (2:30) Sara - *Goals:* (Cur. Guide dist.) • **Bagley 260**	cont'd	◇ *Simulation* Jigsaw - Mini Sessions	*Available Projects:* ▼ Dream Catchers ▲ God's Eyes	◇ *Simulation* Jigsaw - Mini Sessions
3pm	Administrative Stuff **3:15 - Haggett Downstairs** campus tours **(3:30 - 4:00)** (End up back @ **Haggett Downstairs**)	Discussion on *SCIENCE* ◆ Sara Selfe ❒ James Nason ❒ Chris Morganroth ❒ Gene Hunn • **Bagley 260**	BRAINSTORMING Large group discussion about the simulation problem	◇ *Simulation* Jigsaw - Mini Sessions	Hooks & Ladders (Group Activity)	◇ *Simulation* Jigsaw - Mini Sessions
4pm	*WELCOME* @ 4:00 ◆ Sara Selfe ◆ Nan Little ◆ All the Crew! ✣ Kids: Rules & Goals ✣ Teachers: R.Guide, Cultural Sensitivity/Goals	Pre-Tests • Cultural Awareness • Science Aptitude	Group Planning & Sm. Group Organizing Journals: **(kids)** ❒ Ned Blackhawk **108** **Teachers** - Preparation: ❒ Richard Powell **260** ❒ Anne Olson **331A**	◇ *Simulation* Jigsaw - Mini Sessions ◆ Kirsten Anderson ◆ Ronald Bates ◆ Daryl Mathews ◆ John Schmied ◆ Briana Johnson ◆ Kateri Urbanec ◆ Justin Finkbonner	◆ Richard Powell Geology Presentation ◆ Ron Bates Perc. test & mapping	3:30 Leave for home
5:30 pm	Dinner: 5:30 - 7 pm daily	Dinner	Dinner	Dinner	Salmon Bake	***Have a great weekend!***

BEST COPY AVAILABLE

NASON Summer Institute '95 (WEEK 2) July 17-21, 1995 Morning/Afternoon Schedule

	MONDAY - 17	TUESDAY - 18	WEDNESDAY - 19	THURSDAY - 20	FRIDAY - 21
8:30 am	Breakfast: 7 - 8:30 am daily		Load Bus & Vans @ 8:00 Haggett Entry		
9am	■ LaMotte Kits - H_2O (everyone) - LAB 233 ◆ Briana ◆ Julia	■ Conductivity Testers HS - B 260 MS - LAB 233	8:30 depart for Cedar River Watershed	■ Lab: B.2 - Density HS - B 260 MS - LAB 233	■ Lab: B.8 - H_2O Testing HS - B 260 MS - LAB 233
10am	(Groups Switch)	cont'd	Group A - Cedar Falls Group B - Masonry Dam	cont'd	cont'd
11am	Computer Instruction ◆ Chris Sterling Comm.unication Bldg. - G20	cont'd	Group A - Masonry Dam Group B - Cedar Falls	cont'd	cont'd
NOON	Lunch	Lunch	Lunch @ C. Morse Lake ▼ Archaeology & Repatriation discussion ❒ Astrida	Lunch	Lunch
1pm	meet @ 12:45 front of Bagley ◇ Simulation Jigsaw - Mini Sessions	meet @ 12:45 front of Bagley ◇ Simulation Jigsaw - Mini Sessions	1:30 Group A - H_2O Testing @ Chester Morse Lake Group B - forest mapping	◇ Simulation	◇ Simulation
2pm	◇ Simulation Jigsaw - Mini Sessions	◇ Simulation Jigsaw - Mini Sessions	Group A - forest mapping Group B - H_2O Testing @ 2:30 - Head for Landsburg Dam	◇ Simulation	◇ Simulation
3pm	◇ Simulation Jigsaw - Mini Sessions	◇ Simulation Jigsaw - Mini Sessions	3:15 Group A - Hatchery Group B - H_2O (3:45 - switch)	◇ Simulation Report Out @ 3:00	◇ Simulation Report Out @ 3:00
4pm	◇ Simulation Jigsaw - Mini Sessions	◇ Simulation Jigsaw - Mini Sessions	4:30 Small group to Mouth of Cedar River Depart for University !	Canoeing & Water Testing Water Front Activity Center	3:30 Leave for home
5:30 pm	Dinner: 5:30 - 7 pm daily	Dinner	Dinner	cont'd	Have a great weekend!

BEST COPY AVAILABLE

NASON Summer Institute '95 (WEEK 3) July 24-28, 1995 Morning/Afternoon Schedule

	MONDAY - 24	TUESDAY - 25	WEDNESDAY - 26	THURSDAY - 27	FRIDAY - 28
8:30 am	Breakfast: 7 - 8:30 am daily	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio
9am	■ High School Bagley 260 ■ Middle School/Para-pros Bagley 108	■ High School Bagley 260 ■ Middle School/Para-pros Bagley 108	■ High School Bagley 260 ■ Middle School/Para-pros Bagley 108	Students: Bristol/Meyer/Squib 8:30 Haggett Lobby Teachers: Grant Writing Seminar ◆ Nan Little Bag. 260	MINI-SESSIONS:
10am	All - *acids, bases, pH, etc. Red Cabbage Lab LAB Bagley 233 Alpha group - Bag 108	Everyone - Lab: C.12 - Bagley 233- * Solvents Charlie group - Bag 108	*spectrum box	Teachers: Grant Writing cont'd (Break: @ 10:45)	(Computerized Resource Guide, Spectrum box cont'd, "Cultural Awareness in the Classroom")
11am	Lab time, cont'd Beta group - Bag 108	Delta group - Bag 108	Beta group - Bag 108	Teachers: National Science Standard Bag 260	cont'd
NOON	Lunch	Lunch	Lunch	Lunch (students eat @ BMS then meet us at PSC)	Lunch
1pm	Native American Issues Discussion Room 102 - New Chem Bldg.	computer time with Chris (group sign up) ◇ Simulation - research time	Sherman Alexie	✣ Pacific Science Center Load Bus @ 12:45 front of Hagget	Everyone - Bagley 260 Richard Gammon - Global Climate Change
2pm	cont'd	◇ Simulation - research time	con't	✳ Symmetry: A Universe by Design ✳ Connecting w/ Chemistry	◇ Simulation Rough Drafts Duell
3pm	Small Group meeting until 3:30 Re-assemble large group	Report Out @ 3:30 Haggett Patio	con't	IMAX show: Ø DESTINY IN SPACE	◇ Simulation - research time Report Out @ 3:00
430 pm	Speaker:Scott Pinkham - OMA Haggett Hall Lounge	Speaker: Deb Parker Cultural Exchange Issues Haggett Lounge	con't	Return to Campus	3:30 Leave for home
5:30 pm	Dinner: 5:30 - 7 pm daily	Dinner	Dinner	Dinner	Have a great weekend!

NASON Summer Institute '95 (WEEK 4) July 31-Aug. 4, 1995 Morning/Afternoon Schedule

	MONDAY - 31	TUESDAY - 1	WEDNESDAY - 2	THURSDAY - 3	FRIDAY - 4
8:30 a.m	Breakfast: 7 - 8:30 am daily Group Circle/Council Bagely 260	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio	8:30 Group Circle Haggett Patio
9am	MINI SESSIONS: (seven intelligences, chromotography lab, Bella Bella Slide Show by Chris Morganroth)	Students: Alpha/Beta - Lab Reports Bagley 108 Charlie/Delta - Writing Bagley 336 Switch @ 10:30	⇨ Morning to work on Research Projects	↗ Follow-Up Tests • Cultural Awarness • Science Aptitude	NASON '95 Slide Show & NASON '95 Video Viewing
10am	cont'd	Teachers & Para-Pros: Grant Writing (9-10:30) Choice: Computer, Lab, or Research	cont'd	Finishing project and getting ready to present	cont'd
11am	cont'd	cont'd	cont'd	cont'd	Barbeque
NOON	Lunch	Lunch	Lunch	Lunch	cont'd
1pm	◇ Simulation	◇ Research	Student Presentations Bagley 260	*Presentation* to panel and guests Bagley 260	*Closing Ceremonies* *Patio of Haggett Hall*
2pm	◇ Simulation	⇕	cont'd	⇕	(Certificates)
3pm	◇ Simulation	⇕	cont'd	⇕	Hawiian/Tahitian Dance Performance
4pm	◇ Simulation	⇕	cont'd	⇕	✔ Check - Out
5pm	Dinner 5:30 - 7 pm daily	Dinner	Dinner	Dinner	See You all at the Retreat!

BEST COPY AVAILABLE

NASON WEEK 1 Template Date July 7-12 7/5/96

Date						
	Sunday 7	Monday 8	Tuesday 9	Wednesday 10	Thursday 11	Friday 12
8:30am			Meet in Terry/Lander Lounge - *Review of day*	Leave for Discovery Park - Daybreak Star	Meet in Terry/Lander Lounge - *Review of day*	Meet in Terry/Lander Lounge - *Review of day*
9am		Introductions: *Sara* Welcome Ceremony: *Harold Belmont* (Suquamish) University Welcome:*Dean John Simpson*	What is a watershed? What do we need to know?: *Sara* Bag 260	Archeology of West Point: *Leonard Forsman* (Suquamish)	Introduction to water-Structure, properties, uses: *John*- Bag 260	Introduction to computers: Email, Searching the Web - *Briana* - Bag 336
10am		Elder Welcome - *Harold Belmont* CHB 102	Speaker: *Charlene Poste* (Squaxin Island) Cultural Significance of Environmental Stewardship - Bag 260	1030A - Tour of Metro Plant: *Bob Peterson*		Cont'd
11am		Pre-Institute Evaluation-Bag 260	Cont'd	Cont'd	Students- Making sparklers - Bag 133 Teachers - Grant writing workshop-Bag 260	Making a conductivity tester - Bag 133
12		Lunch	Lunch	Cont'd	Lunch	Lunch
1pm		Institute Goals - *Sara* Hand out syllabus Bag 260	Break into 2 groups: A: View Puget Sound Model - *Kathy Newell* - Oceanography	Lunch at Daybreak Star	Why do canoes float? - The concept of density - Prelab - Bag 133	The Periodic Table: *John* Bag 260
2pm	check in Terry/Lander dorms NASON Table in lobby - *Kateri and Sean*	Tour of Campus Puzzle	B: Videotape on West Point Archeology - Bag 260	Geology of Puget Sound - *Aaron*	*Density Lab* - A: Density Column B: Density of Diet Coke *vs* Coke	Review of week - assignments due Get T-shirts or tennis shoes for next week Bag 260
3pm	Cont'd	Cont'd	Laboratory Safety, Keeping a laboratory notebook - *Sara* - Bag 260	Cont'd	Post lab debrief	WA folks leave for home -Staff review each day Bag 332
4pm-	Welcome -	See you at the puzzle solution!!!	Time in Resource Room to investigate projects - Bag 303		Time in Resource Room to investigate projects - Bag 303	
5pm	Dorm Rules - Terry/Lander RA	Staff review each day Bag 332	Staff review each day Bag 332		Staff review each day Bag 332	
5:30pm	Dinner	Dinner	Dinner	Salmon Dinner at Daybreak Star	Dinner	
7pm	Band meetings - Ethnic Cultural Center (ECC)	Crafts: Dreamcatchers and God's eyes ECC	Native American Barbie Doll: *Anneliese Truame*, (Pima) - ECC		Demo Night - *Sara* Bag 154	

NASON WEEK 2 Template Date July 14-19 7/5/96

Date						
	Sunday 14	Monday 15	Tuesday 16	Wednesday 17	Thursday 18	Friday 19
8:30a.m		Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	**8:30 Leave** for Cedar River Watershed	Meet in Terry'Lander Lounge - *Review of day*
9am		Ions, Polarity, Solubility: *Sara* Bag 260	Why does fry bread rise? - Acid/Base Chemistry *John*- Bag 260	Introduction to Jigsaw - Bag 133	930A: Arrive at Watershed - Bldg A- slide show (Celese) and view topographical model of watershed (Marie)	How do we know what stars are made of? - Spectroscopy - A: Making spectrum boxes
10am		Cont'd	Acid/Base Laboratory: A: Using Red Cabbage as an Indicator B: Microscale Titration	Jigsaw: Watershed issues A: Pollution (ppm/ppb) B: Riparian areas	Chester Morris Lake, water testing, percolation test, forest mapping, archeology	B: Detecting elements using an ICP - *Tom Leach* Bag 133A
11am		Pre-lab Briefing	Bag 133 Cont'd	C: Effects of road building D: Stream contours	Cont'd	Cont'd
12		Lunch	Lunch	Lunch	Lunch - at Chester Morris Lake	Lunch
1pm		Experiments: Solvents, Chromatography of ink Chromatography of M&M's Bag 133	Seven Intelligences - *Richard Powell*	Water testing - Learning to use the LaMotte kits Bag 133	Break into two groups - One group to Cedar Falls break into two groups - view falls, penstocks - Test water at stream	Introduction to the UW Library system
2pm		making designs on tennis shoes and T-shirts	Cont'd	Cont'd	Other group to Masonry Dam	Review of week - progress reports due
3pm		Work on your projects - Bag 133	Cont'd	Work on your projects - Bag 133	Cont'd	WA folks leave for home - Staff review each day Bag 332
4pm-		High school students - science fair Teachers - Laboratory activity	Cont'd	Cont'd	Return to campus	
5pm	return to dorm, students check in with NASON RA's	Staff review each day Bag 332	Staff review each day Bag 332	Staff review each day Bag 332	Staff review each day Bag 332	
5:30pm		Dinner	Dinner	Dinner	Dinner	Dinner
7pm		Educational Issues	Make Fry Bread - ECC	Movie Night - Bag 154		

NASON WEEK 3 Template Date July 21-26 7/5/96

Date						
	Sunday 21	Monday 22	Tuesday 23	Wednesday 24	Thursday 25	Friday 26
8:30a.m		Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	**7:30 Leave** for Mt. Rainier	Meet in Terry'Lander Lounge - *Review of day*
9am		Introduction to groundwater - *Sara* Bag 260	Glacier EXCEL exercise - *Briana* - Bag 336	Cleaning up our water - *Sara* - Bag 260	Still trying to get there	Teacher Presentations - Glacier Formation
10am		*David Fuller, Hydrogeologist and Sherry Crowell (Suquamish)* Groundwater Model	Cont'd	Foul water lab - Bag 133	Arrive at Paradise *Loren Lane*, Park Ranger	Cont'd
11am		Groundwater projects on the Port Madison Indian Reservation - Bag 260	SEPUP Activity - Groundwater contamination on Reservation X - Bag 133	Cont'd	*Mildred Frazier* (Nisqually): Cultural significance of Mt. Rainier	Hyperstudio Presentation
12		Lunch	Lunch	Lunch	Lunch -	Lunch
1pm		Teacher Presentations - Secrets of Native Cooking - Superfoods	Groundwater contamination - Bag 133	Teacher Presentations - Water Conservation	Break into two groups - Guided walk at Paradise	Teacher Presentation - Wind and Weather "Gluscabi and the Wind Eagle
2pm		Cont'd	Cont'd	Cont'd - Soil Ecology	Leave Paradise for Grove of the Patriachs	Review of week - progress reports due
3pm		Students work on Science Fair project Teachers- Work on presentation or writeup	Students work on Science Fair project Teachers- Work on presentation or writeup	Food Web of an old Growth Forest - Bag 260	Walk thru old growth forest - forest mapping	WA folks leave for home
4pm-		Cont'd	Cont'd	Cont'd	Return to campus	
5pm	return to dorm, students check in with NASON RA's	Staff review each day Bag 332	Staff review each day Bag 332	Staff review each day Bag 332	Staff review each day Bag 332	Staff review each day Bag 332
5:30pm		Dinner	Dinner	Dinner	Dinner	Dinner
7pm		*Wesley Thomas (Navajo)*- Navajo weaving and poetry - ECC	Mariner's Baseball Game	Preparing for college - *Scott Pinkham (Nez Perce)* - ECC		

NASON WEEK 4 Template Date July 28-August 2 7/5/96

Date						
	Sunday 28	Monday 29	Tuesday 30	Wednesday 31	Thursday 1	Friday 2
8:30a.m		Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry'Lander Lounge - *Review of day*	Meet in Terry/Lander Lounge	
9am		Teacher Presentations - Abnormal Behavior of Water	Estuaries - Bag 260	Fun Chemistry Experiments - Bag 133	Leave for field trip to Metro Environmental Lab	Packing and Leaving
10am		Cont'd	Plotting salt water concentration in an estuary - Chloride titration - Bag 133	How much fat in a hotdog?	Tour of Metro water facilities	
11am		Cont'd	Cont'd	Household Chemicals	Cont'd	Graduation Luncheon - ECC
12		Lunch	Lunch	Lunch	Lunch	
1pm		Teacher Presentations - Water Olympics - Cohesion, Surface tension, Density	Teacher Presentations - Polymers	Teacher Presentations - Life cycle of the salmon	Student Science Fair Preparation - Bag 133	
2pm		Cont'd	Cont'd - Using the Medicine Wheel in Teaching	Cont'd	Judging starts at 230P - Bag 133	
3pm		Work on your projects	Work on your projects	Work on your projects	Cont'd	
4pm-		Cont'd	Cont'd	Cont'd	Post-test Evaluations	
5pm	return to dorm, students check in with NASON RA's	Staff review each day *B 332*	Staff review each day *B 332*	Staff review each day *B 332*	Staff review each day *B 332*	
5:30pm		Dinner	Dinner	Dinner	Dinner	
7pm				Students final mad rush to finish science fair posters	Campfire at Shilshole	

Native American Science Outreach Network
(NASON)

APPENDIX B

University of Washington
Office of Educational Assessment

Gerald M. Gillmore, Ph.D., Director
Nana Lowell, Ph.D., Associate Director
Thomas Taggart, M.Div., Assistant Director

95-7

Native American Science Outreach Network (NASON) Summer Institute, 1995 - An Evaluation

Lauren Basson
Thomas Taggart

October, 1995

The Office of Educational Assessment is an agency of the University of Washington which provides a variety of services related to educational research and assessment. The following are programs within which these services are provided:

- Institutional Research
- Student Outcomes Assessment
- Instructional Evaluation
- Test Scoring and Analysis
- Standardized Testing

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute, 1995 - An Evaluation

EXECUTIVE SUMMARY

The Native American Science Outreach Network (NASON) is a program sponsored by the University of Washington's Department of Chemistry which seeks to engage Native Americans in the fields of science. Subsequent to the inaugural NASON Summer Institute in 1994, the 1995 event was held from July 9 to August 4, 1995. NASON invited to the UW campus middle school and high school science teachers of classes that included Native American students. Along with the teachers, a number of Native American paraprofessionals who also worked in schools assisting in the teaching of science were recruited to attend. In addition, Native American high school students from across the state were invited to participate in this unique endeavor. The purpose of the NASON Institute was two fold. The first goal, set for teachers and paraprofessionals, was to improve the teaching of science by providing teachers and paraprofessionals with scientific and laboratory skills, and, as importantly, the historical and cultural background of their Native American students in order to have science become relevant to them. The second goal was to empower the students to see science as an important part of their lives, both individual and tribal, and to inspire a belief that they could succeed in their studies.

The Office of Educational Assessment (OEA) of the University of Washington was retained to provide an evaluation of the 1995 Institute. This evaluation, of which this report is the first step, would include the administration of a series of surveys to participants, a review of portfolios and papers prepared during the Institute, and interviews with selected participants from both 1994 and 1995. This report details only the results of survey questionnaires.

Each individual within the three groups (teachers, paraprofessionals, and students) was given a total of four surveys during the course of the Institute. One survey was given at the beginning in order to establish the initial views and perceptions of the participants. At the conclusion of the Institute, a similar questionnaire was administered which attempted to measure changes in perspectives that may have been the result of the NASON activities. These two (pre-Institute and post-Institute) surveys were slightly different for each group. Each participant was asked to use a unique but anonymous identifier on each questionnaire so that individual changes could be tracked. The final two instruments were identical and asked respondents to rate events and activities of the Institute and evaluate the final project presentation.

Demographically, teachers were primarily Caucasian and male while the paraprofessionals and students were exclusively Native American and gender balanced.

Teachers averaged more than 40 years of age but had only been teaching an average of 4.3 years. Paraprofessionals averaged 33.25 years of age and students 16.2.

In large measure, the teachers and the paraprofessionals shared common approaches to how classes should be conducted. The Institute seemed to have similar impacts on them. By the end of the Institute they indicated a tendency to alter their teaching "style" in ways that would encourage Native American students to respond. Generally, the teacher's and paraprofessional's confidence level in their ability to teach science was also boosted by the Institute. Perhaps one of the biggest impacts was on how teachers would schedule their classes after the Institute. They indicated that they would spend considerably more time on conducting experiments in class and a proportionally less time lecturing. Both teachers and paraprofessionals believed that they had learned scientific and laboratory skills and had been better prepared to teach Native American students.

Students, too, seem to have received motivation from the Institute. Comparing their educational plans before and after the Institute, students seemed much more focused and realistic in their goals. Although this group of students was already interested in science from the outset, their interest was increased as was their belief that Native Americans were capable in the fields of science. The Institute seemed to have little impact on student's study habits, however. Students thought the Institute had given them valuable scientific and laboratory skills and had better prepared them for success in science.

Almost all of the events and activities of the Institute were found by participants to be useful. There were, however, some differences of opinion among groups about the level of usefulness of some events. Teachers did not find the computer instructions useful, but students found it to be one of the most useful. This seemed to indicate that some events are more appropriate for one group than another. The most highly rated events were the laboratories, the presentation, "demo" night, and Sherman Alexie.

The final project presentation was judged by all participants to be a success. Members of the different groups expressed interest in working with each other and thought that their work was interesting and would have benefit beyond the Institute.

In a series of open ended questions, the participants expressed a number of views. Teachers and paraprofessional indicated a commitment to integrate Native American culture into science teaching. They expressed a desire to make Native American students feel welcome in their classes although they differed on approach and specific courses of action. Their comments indicated that they felt the Institute had assisted them to be much more effective, particularly in science and laboratory skills. Students expressed both a renewed sense of interest in science and an enhanced perception of what hard work it is.

In large measure, the goals of the 1995 NASON Summer Institute were met. Teachers and paraprofessional were revitalized and given new tools to improve their science teaching. Students, too, seemed to take from the Institute an enhanced interest in science that was tempered by a more realistic view. All participants discovered new ways for science to be relevant in their communities.

95-7

Native American Science Outreach Network (NASON) Summer Institute, 1995 - An Evaluation

Lauren Basson
Thomas Taggart

September 1995

INTRODUCTION

The Department of Chemistry of the University of Washington is the sponsor of a Native American Science Outreach Network (NASON) which seeks to engage Native Americans in the fields of science. During the Summer of 1994, NASON sponsored the first of a proposed series of institutes to gather together teachers involved in the instruction of Native American high school and middle school students. Also included in the NASON Summer Institute were Native American paraprofessionals (educational facilitators who worked with teachers in middle and high schools), and a select group of Native American high school students. These three groups resided on the UW campus for four weeks and participated in a series of experiences including field trips, lectures, demonstrations, laboratory experiences, and presentations both on science and Native American history and culture.

In a continuation of this program for the 1995 Summer Institute, NASON invited new participants representing the three groups (teachers, students, and paraprofessionals) to be involved in a four week program that built on the strengths of the previous year's experience and improved other elements. The two primary and parallel goals of the Institute were; 1) to enable teachers and paraprofessionals to improve the teaching of science to high school and middle school students, particularly Native American students, and 2) to encourage Native American high school students to pursue the study of science. These two goals were designed to be complementary. Participants would be organized into mixed groups (teachers, paraprofessionals and students) during the course of the Institute and would work together toward a final presentation that would apply scientific principles towards the solution of a real problem faced by a Native American community.

The principal leaders and organizers of the Institute were Nan Little (Director of NASON), and Dr. Sara Selfe (Senior Lecturer in the Department of Chemistry). They contacted the University of Washington Office of Educational Assessment (OEA) to assist them in an independent evaluation of the 1995 Institute.

OEA interviewed the Institute leaders, Ms. Little and Dr. Selfe, to initiate the evaluation process. From these discussions, OEA proposed a schedule of evaluation activities as listed below:

1. Prepare and summarize pre-. and post- Institute questionnaires
2. Prepare and summarize activities questionnaires
3. Review participant portfolios
4. Summarize reflective papers
5. Prepare and summarize presentation questionnaires
6. Interview and/or survey 1994 and 1995 Summer Institute participants
7. Report on these evaluation activities

NASON and OEA agreed to follow this agenda for the 1995 Summer Institute. This preliminary report addresses only the aspects of the before and after surveys, activities, and presentation questionnaires[1]. Review of the portfolios, summarization of the reflective papers, and reporting on the participant interviews will take place at a later date.

METHOD

OEA began the evaluation process by identifying specific elements of the Institute's goal for teachers and paraprofessionals. These elements included conduct of teaching in the classroom, attitudes toward Native Americans, and styles of teaching. For evaluating the success of the Institute's goal for students, the elements evaluated were the students' educational plans, their attitudes about science, their perception about the relationship of science to Native Americans and their learning styles. The before and after Institute questionnaires were constructed to measure the effect of participants' experiences at the Institute on accomplishment of these goals. Three slightly different questionnaires were developed for each group incorporating these specific elements or aspects. Participants were also asked for demographic information. For teachers and paraprofessionals, these data included the length of time involved in teaching, and their educational background. Students were questioned about their short term and long term educational objectives.

All participants were given the opportunity to develop a "secret code" to label pre & post questionnaires. This code would serve as an anonymous means of comparing pre- and post-Institute responses. This method of identification was largely successful although a few respondents joined the Institute late and were not given the pre-test and two participants forgot their "code." The assessment of the results was also somewhat mitigated because some paraprofessionals and one-fourth of the students failed to take the post-Institute survey.

[1] See Appendices 1-4.

RESULTS

Demographics

The gender distribution and ethnic make-up of program participants is shown in Table 1. The gender distribution was balanced for students. There were more men than women teachers and more female than male paraprofessionals. The majority of teachers were Caucasian, and the paraprofessionals and students were all Native American.

Table 1: Gender and Ethnic Distribution

Group	Male	Female	Alaskan Native	Asian-American	Native American	Caucasian
Teachers	12	8	1	1	5	14
Paraprof.	4	5	-	-	9	-
Students	12	12	-	-	24	-

Teachers and paraprofessionals were asked to provide their ages and tenure in an educational career. Teachers averaged 40.3 years of age but had been teaching an average of only 4.3 years. Paraprofessionals were somewhat younger on average (33.25) and had an average of 4 years in education. The average age of the students was 16.2.

Paraprofessionals were also asked about their educational background and future plans. The results are shown in Table 2. Of the two people indicating "other" as a choice for present educational level, one is presently attending community college and the other is in a four-year college. The one "other" response for future plans had law school as a goal.

Table 2: Paraprofessional Education - Present and Future

Present Educational Level		Future Educational Plans	
High School Diploma	3	Bachelor of Arts or Science	2
Associate of Arts Degree	3	Masters Degree	5
Other	2	Other	1

Teachers and Paraprofessionals

In the first set of inquiries, teachers and paraprofessionals were asked to respond to similar statements regarding classroom conduct. The range of response permitted was from "Most of the Time" (4) to "Almost Never" (1). The phrasing of the statements for teachers and paraprofessionals was somewhat different in that paraprofessionals generally have little control over either the curriculum or the conduct of the classrooms in which they work. Teachers were also asked three questions that paraprofessionals were not. These questions were related to how teachers direct the flow in their classrooms. All of these questions were repeated in the post-Institute questionnaire asking respondents to forecast future classes in which they will be involved. The purpose of these paired questions was to see if the Institute had an impact on approaches to teaching or classroom assistance "style." The means of the responses are shown in Table 3.

BEST COPY AVAILABLE

1 = Most of the time 2 = Frequently 3 = Sometimes 1 = Almost Never

Table 3: Teachers and Paraprofessionals - Classroom Conduct

Statement	Teacher Pre-test	Paraprof. Pre-test	Teacher Post-test	Paraprof. Post-test
I enjoy assisting/teaching science.	1.95	2.00	1.70	2.29
Students apply what they are learning to real life situations and to their personal experiences.	2.35	2.50	1.75	1.71
Students brainstorm ideas.	1.80	2.75	1.70	1.57
The 1st student who raises his/her hand is called on.	3.00	2.25	3.25	2.71
Studying is related to tribal issues.	2.95	3.13	2.25	2.14
Studying is related to careers.	2.25	2.14	2.00	2.00
Students are asked to explain how they arrived at an answer.	2.35	2.50	2.05	2.14
Students are exposed to Native American as well as non-Native role models in science.	3.30	3.25	2.20	1.57
Parents or community members help or teach in the classroom.	3.60	3.25	2.65	1.86
Students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	2.95	-	2.05	-
"What if" questions are asked.	2.35	-	1.70	-
I wait 3 seconds before calling on a student.	1.74	-	1.35	-

When reviewing these responses, it is important to keep in mind that these teachers and paraprofessionals are not talking about the same classroom experiences. As far as is known, none of the teachers and paraprofessionals teach together in the same classroom. Consequently, their responses are not differing perceptions of the same phenomena. The responses indicate that both teachers and paraprofessionals frequently enjoy their roles in teaching science. However, teachers expected that their enjoyment would be even greater in the future, whereas the paraprofessionals expected their enjoyment will be less frequent.

In general the responses point to outcomes sought by the Institute. Teachers and paraprofessionals indicate an intention to increase the frequency of "positive" teaching behaviors and a reduction in conduct purported to be less effective. Teachers and paraprofessionals expected their future students to more frequently apply what they had learned to real life, brainstorm ideas, and explain how they arrived at an answer. These future students would also have their studies related more closely to tribal and careers issues. They would also be exposed to Native American role models. Teachers reported they would modify their behavior by asking more "what if" questions, being less likely to call on the first student to raise his or her hand, and waiting three seconds before calling on anyone. They also thought themselves more likely to have students make visual representations of scientific concepts.

Teachers and paraprofessionals were also asked to respond to a second set of statements intended to explore their feelings and thoughts about teaching Native American students. The range of responses permitted to these statements was from "Strongly Agree" (1) to "Strongly Disagree" (5). The results are shown in Table 4. Teachers showed a substantial increase in their confidence in teaching science to Native American students after participating in NASON while paraprofessionals showed only minor weakening of confidence levels. All respondents maintained a strong belief in the critical role of the family before and after the Institute. Both groups also strongly agreed that it was important to develop relationships with their students' families. Both groups maintained strong agreement to the idea that Native American history and culture are important to understand.

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree

Table 4: Teachers and Paraprofessionals - Instruction of Native American Students

Statement	Teacher Pre-test	Paraprof. Pre-test	Teacher Post-test	Paraprof. Post-test
I feel confident in my ability to teach science to Native American students.	2.80	2.00	1.75	2.14
The family plays a critical role in helping a student achieve academically.	1.40	1.14	1.45	1.14
It is important for me to develop relationships with the families of Native American students.	1.65	1.75	1.50	1.43
It is important for me to understand Native American history and culture in order to be a better teacher/helper for my students.	1.50	1.25	1.35	1.43

In a separate question, teachers were asked to describe how they divided a typical teaching day. They were asked to distribute 100% of their classroom time between the following methods of delivering science instruction:

Lecture
Teacher demonstration
Class discussion
Small group work
Student presentation
Experiment / Hands- on activity
Other

Examples of "other" types of classroom activities included "write ups", GED preparation kits, presentations by visitors, field trips, whole group projects, and visual presentations such as movies, videotapes, or slides. The results of the pre- and post- questionnaires are shown in Chart 1. A careful review of the chart will show that the totals do not equal 100%. This is due to the fact that some of the individual responses did not equal 100%. However, it is clear that the Institute had a marked impact on how teachers would divide the typical class day. Experiments and other hands-on activities almost doubled in time allotted and

presentations gained as well. Most other types of activity showed a modest decrease in time allotted, but lecture format decreased the most, losing almost half its projected time. One unanticipated outcome was a decrease in time for group work despite the fact that a significant part of the Institute was predicated on group work on presentations.

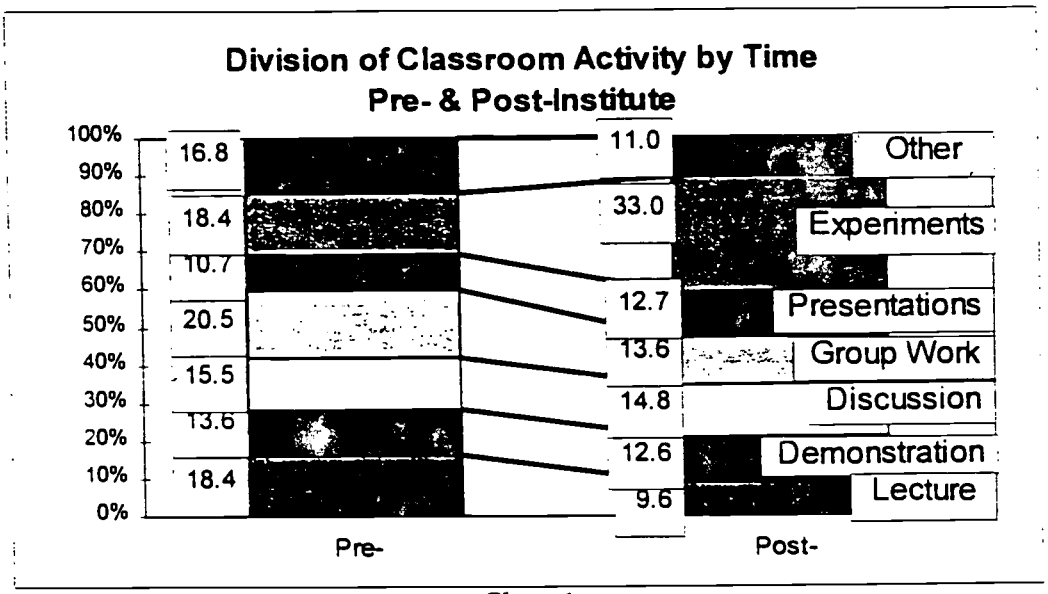

Chart 1

Paraprofessionals were also asked to respond to some statements that were posed to students but not to teachers. The responses will be discussed below in the discussion of student perceptions.

Students

As a starting point, students were asked about their immediate educational plans and about their ultimate academic goals. These queries were repeated in the post-Institute questionnaire as well. Unfortunately, these results and all other comments regarding students should be considered in the light that one-fourth of the students did not respond to the concluding surveys. Consequently, comparisons lack viability. With this caution in mind, the results can be seen in Table 5. It would seem that one impact of the Institute was to raise the expectations of the students. At the same time, these expectations were made more realistic. At the conclusion of the Institute, fewere students held a Ph.D. as a goal, but more were aiming beyond a Bachelor's degree toward a Master's. Interestingly, the one student who indicated that he would not finish high school also indicated that he hoped to receive a Bachelor's degree. Of the two respondents who indicated "other" as their educational goal, one wanted "whichever is highest" and the other didn't know which to choose.

BEST COPY AVAILABLE

Table 5: Student's Educational Plans and Goals, Number Responding

Educational Plans	Pre-Test	Post-Test
Won't finish high school	1	-
Finish high school but no more.	-	-
After high school, go to Vocational school.	-	3
After high school, go to a community college.	2	3
After high school, go to a 4-year college.	19	12
Educational Goals		
High School Diploma	-	-
AA Degree	-	-
Bachelor's Degree (4-Year college)	8	2
Master's Degree	4	7
Ph. D.	8	5
MD	3	2
Other	-	2

Students were next asked to respond to a series of statements related to their perception of science and its relationship to Native Americans. The statements were adapted from an instrument developed by Catherine Matthews of the University of North Carolina - Greensboro and Walter Smith of the University of Kansas.[2] The original Matthew/Smith instrument was used to assess the attitudes of Native American students toward math and science. In the NASON version, students were presented with nineteen statements and asked to rank their responses from "Strongly Agree" (1) to "Strongly Disagree" (5). Several of the statements were negatively posed so that disagreement by the students expressed a positive opinion such as, "My tribe has no use for science or technology." The average of the responses are shown in Table 6.

No standard benchmarks exist for all high school students with which to compare the attitudes of these Native American students. Based on their responses in the pre-test, students perceive that their parents barely "like" them to study science but that the families are very interested in having their students go to college (Items 1 & 12). Students also responded to statements regarding their perceptions of the relationship of science to their community (Items 4, 5, 8, 9, 14, and 15). They strongly agreed that Native Americans and non-Natives can perform equally well in science and that Native Americans had made important scientific discoveries, and, obversely, strongly disagreed that Native Americans were not as capable as other people in science. They strongly disagreed that their tribe had no use for science or technology, and agreed that science will help members of their family and tribe. Finally, their responses to statements about their personal feelings to science tended to show them to be generally interested in science (Items 2, 3, 6, 7, 10, 11, 13, 16, 17, 18, and 19). They disagreed with the proposition that they were bored with science and

[2] Matthews, C. and Smith, W. S. Native American Related Materials in Elementary Science Instruction, *Journal of Research in Science Teaching*, April 1994 Vol. 31 (4) 363-380.

BEST COPY AVAILABLE

agreed that they were interested. They agreed that science helped them understand the world around them and that studying science was important for them personally. They were less in agreement that science helped in understanding themselves. They disagreed with the statement that science does not relate to their lives. They also tended to disagree that science was at odds with their cultural beliefs. They also showed a fair amount of confidence in their ability by agreeing that if they worked hard they could do well in science, and disagreeing with the opposite statement that no matter how hard they worked, they lacked the natural ability to do well.

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree

Table 6: Student Attitudes About Science

Statement	Pre-test	Post-test
1. My parents would like me to study science.	2.48	2.39
2. Science is boring to me.	4.13	3.94
3. What I learn in science does not relate to my life.	3.65	4.00
4. Scientific research can be done equally well by Native Americans and non-Natives.	1.39	1.40
5. My tribe has no use for science or technology.	4.74	4.53
6. No matter how hard I work, I lack the natural ability to do well in science.	3.87	3.56
7. Science helps me understand the world around me.	2.04	2.00
8. I think Native Americans are not as capable as other people in science.	4.57	4.50
9. Native Americans have made important scientific discoveries.	1.83	1.67
10. I would be content just taking the minimum science requirements for high school.	3.70	3.83
11. I believe that studying science is important for me personally.	2.26	2.00
12. My family does not want me to go to college.	4.82	4.89
13. Science helps me understand myself.	2.48	2.44
14. I believe that science will help members of my family and my tribe to have a better life.	2.00	2.22
15. All Americans -- regardless of ethnicity -- have the same need to study science in high school.	2.09	1.78
16. I am interested in a career in science or engineering.	2.30	2.06
17. Science is at odds with my cultural beliefs.	3.74	3.78
18. If I work hard, I can do well in science.	1.87	1.65
19. I am interested in science.	1.91	1.71

Again, comparisons between student responses at the beginning and end of the Institute are made difficult by the low return rate of the post-Institute questionnaire. Student responses to

those items that seemed to be most impacted by the Institute included stronger disagreement with the statement that science did not relate to their lives, and stronger agreement that all Americans need to study science. Perhaps because of the complexity of the work of the Institute, students showed less disagreement with the statement that they lacked the natural ability to do well in science. In counterpoint, they also strengthened their agreement with the proposition that if they worked hard they could do well in science. Also increased was their agreement on the importance of science to them and their interest in science or engineering as a career. At the conclusion of the Institute, they agreed, but less strongly than at the beginning, that science will help their family and tribe.

Certain items were presented to both students and paraprofessionals. These results are shown below in Table 7. The patterns of response in the two groups were similar with one notable exception. Both groups strongly disagreed that their tribes had no use for science and tended to strongly agree that Native Americans had made important scientific discoveries and that all Americans have a need to study science in high school. The opinions on these three items were largely unaffected by the Institute although the students responses showed some minor adjustment. However, on the statement regarding the conflict of science with cultural beliefs, a major change was recorded in the paraprofessional responses. At the beginning of the Institute, the paraprofessionals tended to disagree that science was at odds with their beliefs. However, at the conclusion the mean score of the respondents showed a tendency to agree that there existed a conflict of science and cultural beliefs.

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree

Table 7: Paraprofessional and Student Responses to Selected Items

	Students		Paraprofessionals	
Item	Pre-test	Post-test	Pre-test	Post-test
1. My tribe has no use for science or technology.	4.74	4.53	4.25	4.29
2. Native Americans have made important scientific discoveries.	1.83	1.67	1.50	1.57
3. All Americans -- regardless of ethnicity -- have the same need to study science in high school.	2.09	1.78	1.75	1.86
4. Science is at odds with my cultural beliefs.	3.74	3.78	3.63	2.86

Students were also queried about their learning patterns: whether or not they learned on their own or in groups, and, if so, in what kinds of groups. These questions were asked both pre- and post-Institute. The results are shown in Table 8. Again, results are difficult to analyze because of the poor return of student surveys at the conclusion of the Institute. It would appear that the Institute had little impact on these results except for the category of "Writing a paper" where more students indicated they would write with a group than at the beginning.

64 BEST COPY AVAILABLE

Table 8: Learning Patterns of Students - Alone vs. Groups

Task	Option	Pre-test	Post-test
General Homework	Alone	11	9
	With a group	5	4
	With a couple of close friends	6	4
	With family members	1	1
Studying for a test	Alone	6	6
	With a group	7	4
	With a couple of close friends	9	6
	With family members	0	1
Writing a paper	Alone	17	8
	With a group	1	4
	With a couple of close friends	3	3
	With family members	1	2
Working on a science project	Alone	1	1
	With a group	10	7
	With a couple of close friends	11	8
	With family members	0	1
Reading a book or paper	Alone	19	15
	With a group	1	2
	With a couple of close friends	2	0
	With family members	0	0
Doing library research	Alone	11	9
	With a group	5	3
	With a couple of close friends	5	5
	With family members	1	0

Students were asked whether or not they planned to take science classes in high school and those who responded were unanimous in saying "yes". The distribution of the types of classes that they planned to take is shown in Table 9. Decreases in the number choosing Biology and Earth Science could be explained by the reduction in the number of survey returns. The "other" classes mentioned were Human Anatomy and Human Biology.

Table 9: Science Classes Students Plan to Take

Class	Pre-test	Post-test
Agricultural Science	4	3
Biology	18	13
Chemistry	17	17
Earth Science	11	6
Environmental Science	6	4
Physics	10	10
Other	2	2

Institute Impact on Participants

During the final days of the Institute, all participants were surveyed regarding the impact of the Institute, their rating of events and activities, and their perception of the final presentation. The questions regarding impact were included in the general post-Institute questionnaires which were somewhat different for each of the groups. Identical instruments were given to each group for the event ratings and presentation perceptions. Although the event rating questionnaire was coded to be divided by group, an oversight caused the presentation survey to be distributed without coding so group division is not possible.

Teachers, paraprofessionals, and students were given five common statements regarding specific aims of the Institute to which they indicated their agreement or disagreement. Teachers and paraprofessionals were asked to respond to three other identical statements. Students were asked to rank their agreement to seven additional statements. These series of statements were integrated into the post-test referred to in the discussion of outcomes above. The results are shown in Table 10.

In regard to the common questions given to all groups, the Institute fared very well in conveying scientific content. All groups tended to strongly agree that they had learned scientific principles and chemistry. They also expressed strong agreement with the assertion that they had gained a greater appreciation for Native American history and culture. They expressed comfort in working with each other in groups, with students slightly less comfortable that teachers or paraprofessionals. Learning new computer skills was rated lowest of the five statements in terms of agreement.

In statements posed for teachers and paraprofessionals, there tended to be agreement that they had learned techniques for teaching Native American students effectively, and connecting science to students' everyday lives. On the issue of better communications with parents, there was a disparity between teachers' and paraprofessionals' perceptions of the assistance provided by the Institute. Paraprofessionals tended to agree that this aim had been accomplished while teachers tended to be more neutral.

As for the statements posed for students, they most agreed that the Institute had prepared them to be successful in science. Agreement, too, was also expressed with regard to eagerness to continue their education, a better understanding of the application of science to everyday life, and the scientific basis for environmental actions. They expressed disagreement with the statement that the Institute did NOT increase their appreciation of science. They agreed but with less assurance that they had learned laboratory and study skills at the Institute.

BEST COPY AVAILABLE

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree

Table 10: Impact of the Institute

Statement	Teachers	Paraprof.	Students
I have gained a greater understanding of scientific principles.	1.70	1.57	1.78
I have gained a greater appreciation for Native American history and culture.	1.80	1.67	1.89
I have learned new computer skills.	2.40	2.29	2.06
I have learned principles of chemistry.	1.60	2.14	1.86
I felt comfortable working with the other groups.	1.70	1.29	2.00
I have learned techniques for teaching Native American students effectively.	2.10	2.14	-
I have learned better ways to communicate with the parents of my students.	2.80	2.29	-
I have learned ways to connect the science I teach to the everyday lives of my students.	1.85	2.14	-
Because of the Institute, I am eager to continue my schooling.			2.00
The Institute did NOT increase my appreciation of science.			3.72
I learned many laboratory skills.			2.28
I now feel better prepared to be successful in science.			1.89
I have learned valuable study skills.			2.35
I have a better understanding of how science can be used in everyday life.			2.06
I understand the scientific basis of the way things work in the environment.			2.06

All respondents were asked to rate each of the forty-six events and activities that took place during the four weeks of the Institute. Participants were asked to rate the usefulness of these events and activities on a scale of 1 = not at all useful to 5 = very useful. Responses were divided by group. A complete listing is included in Appendix 5.

The events found to be most useful by all groups included the four laboratories, "Demo night," Sherman Alexie, simulation jigsaws, and the project presentation. The least useful activities for all groups were the mini-session on the resource guide on CD-ROM, team reporting, national and state science standards, opening activities at the Faculty Club, and computer instruction. It should be noted that only three activities were rated by any one group (teachers) as neutral or less that useful. These were the session on the resource guide on CD-ROM (2.69), computer instruction (2.89), and writing-#3 (3.00). All other events and activities were rated by the groups as being useful to some extent.

A comparison of the most and least useful activities by group are shown in Table 11. Tests of significance were run on the scores and some interesting differences between the groups emerged. Teachers felt that computer instruction was significantly less useful than did either paraprofessionals or students. In fact, teachers rated it as one of their least useful activities, and students marked it as one of their most useful. Paraprofessionals thought that the opening activities at the Faculty Club were much more useful than did either students or teachers both of whom rated it as one of the least useful. Paraprofessionals were also more likely to find the team work on the simulation significantly more useful than students.

Perhaps because of their difference in age and experience, the largest differences were observed between ratings by students and the other two groups. Students were more likely to be neutral to the usefulness of the sessions on grant writing and pitfalls in the classrooms than teachers and paraprofessionals. On the other hand, they rated the final writing session and the session on the CD-ROM more highly than teachers. Although they tended to rate the simulation jigsaws as useful. they rated them significantly less useful than both the teachers and paraprofessionals for simulation 1 and than the teachers for simulation 2. They also rated the second session of the simulation team research significantly less useful than did the paraprofessionals. For their most useful choices, student seemed to focus on activities with less academic content such as the baseball game, and trips to Discovery Park and the Science Center.

Table 11 shows only the events and activities that were rated most and least useful the average of the ratings by all participants. It will be noted that these ranking differ somewhat from the ratings by the different groups. For example, student ratings of the usefulness of Laboratory 2, 3, and 4 put them much further down their rankings than the other two groups. In a similar way, teachers ranked Demo night and Sherman Alexie much lower than their counterparts. In the part of the table devoted to the least useful events, the total number of ranking for each group is shown after "Rank" in the heading. For instance, when the mean scores are considered and ranked, the paraprofessionals have 16 rankings, the students 23 and the teachers 37. The two most noticeable inconsistencies are the ranking by paraprofessionals of the Opening at the Faculty Club (6) and the students ranking of Computer Instruction (3).

5 = Very Useful 4 = Somewhat Useful 3 = Neutral 2 = Not very useful 1 = Not at all useful

Table 11: Rated Usefulness of Institute Events and Activities by Group

***Most* Useful Events and Activities By Rating**

Event/Activity	All Groups		Paraprofs		Students		Teachers	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Laboratory 1	1	4.59	1	5.00	4	4.20	1	4.67
Demo night	2	4.53	3	4.67	1	4.80	8	4.33
Project Presentation	3	4.50	1	5.00	4	4.20	5	4.50
Laboratory 3	4	4.45	2	4.83	8	4.00	2	4.59
Sherman Alexie	5	4.39	4	4.60	2	4.40	9	4.31
Laboratory 4	5	4.39	2	4.83	9	3.90	4	4.53
Laboratory 2	6	4.38	2	4.83	8	4.00	6	4.44
Simulation jigsaw 1	6	4.38	3	4.67	9	3.90	3	4.56

***Least* Useful Events and Activities By Rating**

Event/Activity	All Groups		Paraprofs		Students		Teachers	
	Rank (of 37)	Mean	Rank (of 16)	Mean	Rank (of 23)	Mean	Rank (of 37)	Mean
Resource Guide on CD-ROM	37	3.14	15	3.33	12	3.67	37	2.69
Team reporting 2	36	3.27	11	3.83	21	3.20	34	3.12
National & state science standards	35	3.31	12	3.67	16	3.38	33	3.13
Team reporting 1	34	3.38	11	3.83	21	3.20	32	3.33
Opening at the Faculty Club	33	3.47	6	4.33	21	3.20	32	3.33
Computer Instruction	32	3.50	10	4.00	3	4.30	36	2.89
Archaeology talk	31	3.53	16	3.17	19	3.30	25	3.78

In addition to rating the events and activities, participants were asked to list their five favorite evening activities. There were only minor differences in the types of activities favored by each of the groups (See Table 12). Students favored Mariner's baseball game (5), the beach, and the Intramural Activities (IMA) building (4 each), canoeing, basketball, and a trip to the Mall (3 each). The teachers and paraprofessional had more similar tastes. Both chose canoeing as the favorite activity (9 teachers and 5 paraprofessionals). The teachers also liked the Mariner's game (9). Their succeeding choices were "demo" night (8), arts & crafts (7), carving (6), and free time (5). Paraprofessionals liked volleyball, the beach, and the IMA (3 each), and "demo" night (2). Considering all participants, the favorite activities were canoeing (17), the Mariner's baseball game (16), "demo" night (12), the beach, arts & crafts, and IMA (8 each), and basketball and carving (7 each).

Table 12: Favorite Evening Activities by Group

Activity	All Groups	Parapros	Students	Teachers
Canoeing	17	5	3	9
Baseball Game	16	1	5	9
Demo Night	12	2	1	8
Arts & Crafts	8	1	-	7
Beach	8	3	4	1
IMA	8	3	4	1
Basketball	7	1	3	3
Carving	7	1	-	6
Volleyball	6	3	1	2
Free time	5	-	-	5
Mall	3	-	3	-
Discovery Park	3	1	1	1

Participants were also asked to suggest other activities in which they would be interested. This open-ended question engendered a long list (see below), most suggested by only one participant. Interestingly enough, the activity most suggested by teachers was computer training (5) which they had rated as less than useful as conducted by the Institute. This suggests that the training they did receive did not meet their needs. Teachers also suggested more Native American arts activities (2), a trip to Blake Island/Tillicum Village and more planned group activities (3 each). The small number of paraprofessionals who responded wanted more canoeing, a dance party, and more "Indian" speakers (2 each). They also mentioned Blake Island, and more Native American arts activities. Students wanted more field trips (2), Blake Island, and more canoeing. Across all groups the most requested activities were more computer training and more Native American arts activities (5 each), a Blake Island outing and more canoeing (4 each).

Suggested Activities

Activity	N	Activity	N
More Native Am. art activities	5	Arboretum tour	1
More computer training	5	Trip to Waterfront	1
More canoeing	4	Go to a movie	1
Blake Island/Tillicum Village	4	Quiet time after 11 PM	1
More field trips	3	Space Needle	1
More large group activities	3	Staff vs. student games	1
More board games/game night	2	Tour of fishing industry	1
Simulation games/team building	2	Husky football practice	1
Dance party	2	Hands-on stream reclamation	1
More Indian speakers	2	Visit Seattle Aquarium	1
Visit Pt. Defiance Zoo & Aquarium	1	Library skills class	1
Mini Pow-Wow	1	Drumming	1
Scavenger hunt	1	Night at Golden Gardens	1
More team sports	1	Trip to Elliot Bay Bookstore	1

Project Presentations

The last survey that participants took asked them to react to statements regarding the project presentation. During the course of the Institute, mixed groups of teachers, paraprofessionals, and students worked on some element of a major project involving unexplained shellfish deaths on tribal lands. Each group then made a presentation in front of the other Institute participants and invited guests. The statements posed in the survey attempted to gauge each individual's participation in the group process, interest in the work, and the success of their presentation and other presentations. This survey was not coded so it was not possible to divide teacher, paraprofessional, or student reactions. The average of the responses are shown in Table 13.

In general, the group process seemed to be successful in that respondents agreed with statements which were positive about the experience. Although three respondents strongly agreed that they took a leadership role (#1), all three were neutral to the statement that their group had a dynamic leader (#23). For the majority of respondents who took initiative to accomplish tasks (# 2) and for whom listening to others was an agreed upon standard (#3), there was disagreement with the statement that they did not feel connected to the group (# 4). Those respondents who agreed that they felt disconnected from the other members of the group (#4) also tended not to agree that they listened to and took others opinions into account (#3). Without coding it is not possible to identify specific groups but the patterns of answers tend to suggest that at least one "group" never congealed into a functioning unit. Marginal notes on some surveys suggested that the students in one group were fairly disconnected. However, most participants tended to agree that all type of participants got along well (#8).

Generally, the participants found the work interesting and useful both for themselves and their audience (#'s 9, 10, 12). There also seemed to be consensus that this work would be useful after the Institute (#11). The participants found the presentations, their own and others, to be interesting, useful, and well organized (#'s 13, 14, 17 & 18). Most also agreed that their presentation could have been improved (#16). There was also general agreement that the presentations contributed to the overall project in a positive way (#'s 15 & 19). The statements about the discussion drew a very mixed reaction (#'s 20-22, & 25). Some marginal notes indicated that there was no formal discussion and the majority of neutral reaction and reduced number of respondents would tend to bear that out.

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree

Table 13: Project Presentation Ratings

Statement	Mean
1. As a member of my presentation team, I took a leadership role.	2.50
2. As a member of my presentation team. I took initiative to do things.	1.94
3. As a member of my presentation team, I listened to other members and took their opinion into account.	1.53
4. I did not feel connected to the other members of my presentation team.	3.65
5. Members of our presentation team worked together with enthusiasm.	2.62
6. Members of our presentation team worked individually rather than as a group.	3.03
7. I got along well with the other members of my presentation team.	1.82
8. Teachers, paraprofessionals, and students worked well together in my group.	2.15
9. The work that my group did was interesting and useful for the people at the Institute.	2.06
10. The work that my group did was interesting to me.	1.88
11. The work that my group did will be useful to me when I return home..	2.21
12. The audience found our presentation interesting and useful.	2.03
13. Our team's presentation before the audience went very well.	1.94
14. Our group's presentation was well organized.	2.29
15. Our group's presentation contributed to the general project in a positive way.	1.91
16. Our group's presentation could have been improved in useful ways.	2.09
17. The presentations made by other groups were well organized.	2.24
18. The presentations made by other groups were interesting to watch.	2.18
19. The presentations made by other groups contributed to the general project.	2.03
20. I learned a lot from the discussion following the presentations.	2.77
21. The discussion after presentations was boring to me.	3.23
22. The discussion after the presentations was too long.	3.12
23. Our presentation team had a dynamic leader.	2.65
24. In our presentation team everyone contributed equally and there was no single leader.	2.75
25. The discussion was an important part of the general project.	2.37

Open Ended Questions

Participants were asked a series of open-ended questions in the surveys at both the beginning and conclusion of the Institute and in the event and activities questionnaire. Although a few of the questions were asked of all participants, generally participants were asked different questions. Teachers and paraprofessionals were asked similar questions at the beginning and end of the Institute. These questions included questions about how they integrated the teaching of science with Native American culture, how they welcomed Native American students, what methods they found effective for teaching Native American students, and what problems they encountered working with Native American students. Because they set the curriculum, teachers alone were asked about their goals for teaching science. Students

BEST COPY AVAILABLE

were asked what made them feel welcome in a classroom, what were the best and worst things about studying science, and what their career goals were. At the beginning of the Institute, all participants were asked to describe the skills and knowledge they would share with others, and what they hoped to learn at the Institute. At the end of the Institute, all participants were asked what they had learned from the others and what were the best and parts of the NASON Institute. The findings from all of these questions are discussed below.

Integration of Science and Native American Culture

Teachers and paraprofessionals were asked in the pre-test whether they integrated science with Native American culture in their classrooms, and if so, they were requested to provide an example of how this was done. Only six teachers and four paraprofessionals provided examples. More than half of these examples involved studying issues of importance to Native American communities. Two respondents provided examples of incorporating Native American traditions or ways of thought into the study of science and two gave examples that emphasized the connections between scientific issues and Native American culture.

Through the course of the Institute, respondents developed many ideas for ways in which to actively engage students in learning about the connections between scientific principles and Native American ways of life. In the post-test, nearly all respondents provided examples of how they might integrate science with Native American culture and most of these examples involved actively engaging students in studying the connections between scientific issues and Native American culture. Six respondents gave examples that involved this theme in a general way. In addition, four respondents gave examples that included hands-on classroom projects combining scientific principles and Native American culture while six respondents provided examples of hands-on projects involving field trips or other direct contact with Native American communities. Three respondents suggested projects that involved bringing Native American speakers or parents of Native American students to the classroom.

Making Native American Students Feel Welcome in the Classroom

Teachers and paraprofessionals were next asked what they do now and would do in the future to make Native American students feel welcome in the classroom. Responses covered a broad range in both the pre-test and post-test but the emphasis had shifted somewhat by the post-test. The most common responses among teachers in the pre-test were that they would treat the students as equal individuals and not single them out as Native Americans, that they would greet students warmly, respect them, encourage them and maintain a calm attitude in the classroom. Paraprofessionals tended to focus on having respect for the students, listening to them, getting to know them and sharing aspects of their own heritage with them. Thus, whereas teachers tended to emphasize treating students as equal individuals without making them feel "different", paraprofessionals were more apt to stress getting to know students personally and encouraging them to express themselves and share their experiences. Other responses by teachers and paraprofessionals included participating in community events with students, incorporating Native American culture into the classroom, encouraging the pursuit of higher education, and interacting with the families of students.

In the post-test, teachers again tended to focus on treating Native American students as individuals and not singling them out. Almost as many this time mentioned incorporating Native American culture into the classroom. Paraprofessionals emphasized being available to help students when necessary and encouraging them to take pride in their Native American heritage. Other responses from teachers and paraprofessionals in the post-test included talking to students and sharing ideas with them, trying to learn about students' cultural background, using new teaching techniques such as group activities and hands-on projects and offering help when needed.

Responses to the post-test suggested that some teachers had developed a greater awareness of the potential for them to learn from their students and the importance of taking student views into account in their classroom. The predominance of the idea that Native American students should be treated as equal individuals, on the other hand, has ambivalent connotations. In one sense, this attitude can suggest a stand against discrimination and can guard against treating students as "representative" Native Americans. On the other hand, this individualist approach risks ignoring important cultural differences that students might, in fact, wish to explore and share in a supportive environment. Furthermore, the individualist approach, common in teacher responses, is a very particular cultural attitude based on certain assumptions that might not be shared by all students. It is important to note that the majority of teachers were Caucasian and all paraprofessionals were Native Americans. These cultural differences may influence their assumptions.

Effective ways to teach Native American Students

The third question teachers and paraprofessionals were asked was what the most effective things were that they could do when teaching Native American students. The most common responses given by teachers in the pre-test were to relate the material they were teaching to real life situations, to do hands-on projects and to do group work. Paraprofessionals were more likely to respond that the most effective things they did were to answer students' questions, provide encouragement and listen to their students. Other responses given by both teachers and paraprofessionals included helping students to make their own discoveries, acknowledging Native American cultural beliefs and incorporating them into the curriculum, accepting students' input, setting clear goals for students, and promoting cooperative learning.

In the post-test, teachers were more likely to respond that they could be effective by relating material to issues of interest to students and to the larger Native American community and, more generally, by making the class sessions meaningful and relevant for students. Teachers again mentioned hands-on projects and group work as effective teaching methods in the post-test. In addition, teachers wrote about sharing ideas and communicating with their students, having students share their cultural beliefs, being patient, and respecting students. Paraprofessional responses focused on listening to students and working one on one with them. No one in the post-test mentioned helping students to make their own discoveries or setting clear goals for students.

Goals in Teaching Science

Teachers were asked to state their overall goals for students in teaching science. In the pre-test, the most common responses focused on developing scientific knowledge and understanding, developing a sense of curiosity, discovering things for themselves, and learning scientific skills such as observation and critical thinking. Other goals included helping students enjoy learning, preparing them for future education and careers, encouraging them to develop an appreciation and respect for life and for their global environment, guiding students toward assuming responsible roles in their communities, and having them learn practical, everyday applications of math and science.

In the post-test, the most common goal expressed was to have students develop an awareness of how science affects their everyday life. Other frequent responses repeated from the pre-test were to have students develop scientific knowledge and understanding, to have them discover things for themselves, and to enjoy learning. Unlike the pre-test, several of the teachers mentioned that their overall goal was to have students succeed. Other new goals included enhancing students' feelings of competence, helping students recognize the importance of science and having them learn about the connections between science and Native American traditions, the environment and other fields. No one in the post-test specifically mentioned that their goals for students were to prepare them for further education and careers or to have them develop understanding and respect for life and their environment.

Biggest Problems Encountered in Working With Native American Students

In the pre-test, teachers and paraprofessionals were asked about the biggest problems they encountered when teaching Native American students. Teachers were most likely to comment on the low academic skills and performance of their students, disruptive behavior, poor attendance and their own lack of knowledge about students' backgrounds. Paraprofessionals were more likely to comment on the low self-esteem of many students. Other common responses were a lack of motivation among students, difficulties in keeping students' attention and interest, and a lack of parental interest and involvement. Diversity among students, differences in skill levels and lack of resources were mentioned less frequently.

Skills and Knowledge to Share at NASON

Teachers, paraprofessionals and students were asked in the pre-test what skills and knowledge they would like to share at NASON. Teachers tended to mention their knowledge and experiences of working with Native American students and strategies and ideas for teaching science. Paraprofessionals focused on their knowledge of Native American culture and history and two respondents mentioned sharing their knowledge about plants. Students mentioned their verbal, writing and research skills, their open attitudes and willingness to learn from others, and aspects of their Native American heritage. Two students and one teacher wrote that they would like to share their knowledge of science.

What you hope to learn from NASON

The final open-ended question on the pre-test asked teachers, paraprofessionals and students what they would like to learn from NASON. The most common response among teachers was that they would like to learn new ways to approach teaching science. The rest of their responses were fairly evenly split between several categories: scientific knowledge and applications, computer skills, Native American history and culture, appropriate ways to motivate and interact with Native American students, and ways to communicate with the parents of Native American students. Paraprofessionals were most interested in gaining scientific knowledge and learning appropriate ways to interact with Native American students. Nearly all students stated that they hoped to learn more about science. Two students mentioned learning about computers.

In the post-test, students were asked what were the most important things they had learned from NASON. The most common responses were scientific knowledge and skills and how to work with others in a group. Other responses included study skills, awareness of their Native American heritage, and computer skills.

I feel welcome in a classroom when...

In the pre-test, students were asked to complete the phrase "I feel welcome in a classroom when..." Students most frequently responded that they felt welcome when they had friends or knew people in the class or when the teacher or students were friendly. Some students said they felt welcome when the teacher made learning fun, when the teacher greeted them as they entered the class and when other people in the class were enthusiastic or open to learning.

Best Things About Studying Science

Students were then asked what the best things about studying science are. A large majority responded in the pre-test that learning new things was the best part about studying science. Other responses included labwork and dissections, learning the practical applications of science, the challenge involved in studying science and the opportunity for better jobs that it provides. In the post-test, a much smaller majority responded that learning new things was the best part about studying science and several people again mentioned labwork or dissections. In addition, however, students provided several new responses. These included learning about how things work, learning about how science is related to life, science is fun, learning about the environment and feeling a sense of discovery.

Worst Things About Studying Science

Asked what are the worst things about studying science, students gave more varied responses. The most common response in the pre-test was that long lectures and boring teachers were the worst things about studying science. Other responses included the length of time it takes to study, frustration at not understanding concepts or not having things work out, memorizing names of elements on the periodic table, reading the textbook, the smells or dirt involved in the labs, and the tests. Reading science books was mentioned again by several students on the post-test. Other "worst things about studying science" according to students on the post-test are that it is boring, complicated and difficult to understand, hard work, boring experiments, written work, research projects, presentations, and not knowing

enough. These responses suggest that a number of students encountered new expectations and types of assignments during NASON which they found difficult but, perhaps, also challenging. In the pre-test, for example, none of the students even mentioned written work, research projects or presentations. In addition, although students in the post-test complained about science being complicated and difficult to understand, they did not express the same frustration at not understanding concepts or successfully completing experiments that was expressed by some in the pre-test.

Things that should be taught in schools but are not

On the pre-test, students and paraprofessionals were asked to list things they think should be taught in their schools but are not. Students mentioned Native American language, culture and history, practical applications of material for daily life, and different aspects of science. Other responses were computers and more about their religion or Native American spirituality. Paraprofessional answers focused on Native American culture and different aspects of science. In the post-test, twice as many students stated that they would like to learn more about Native American culture and several again mentioned learning more about different aspects of science. On the other hand, no one in the post-test mentioned learning about Native American religion and spirituality. Paraprofessionals were not asked this question in the post-test.

Most Important Things Learned from Teachers, Students and Paraprofessionals

On the post-test, each respondent was asked to list the most important things they had learned from the students, the paraprofessionals and the teachers. In describing what they had learned from students, teachers most often mentioned particular qualities or character traits such as their shyness or their strong sense of morality. Other responses included gaining an understanding of student experiences and difficulties, learning what students enjoy doing - new games, etc., learning to listen to students, and realizing that students are often enthusiastic about learning. Paraprofessionals provided very few responses but they tended to fall into the same categories as those mentioned above. Students said that they learned from fellow students about different feelings and ideas, Native American culture and experiences, meeting people and making new friends, students' personal backgrounds, and how to have fun.

When asked what they had learned from paraprofessionals, teachers tended to mention that they were talented people with good ideas, good role models, an asset to the classroom, and dedicated to their job. A couple of teachers wrote that they had gained an appreciation of the frustrations paraprofessionals sometimes face. Several teachers said they noticed little difference between paraprofessionals and teachers during NASON and were sometimes not even aware of who the paraprofessionals were. Students learned that paraprofessionals were "cool;" that like students, they were still learning, and they learned about their experience of being Native American and their Native American heritage.

When asked what they had learned from the teachers, students responded that they had learned that teachers are people too, they had learned how to communicate and work with them, they had learned study skills and scientific knowledge, and they had learned about different teaching styles and how teachers think. Two students felt that teachers talk too

much and don't pay enough attention to student opinions while another two wrote that they had gained an appreciation of teachers' work and realized how much they care. The most common things teachers learned from each other were new teaching ideas and shared concerns. In addition, teachers mentioned that they had gained support and friendship, that other teachers were helpful, and that they learned that other teachers were not always aware and didn't necessarily have answers to everything. Three teachers also mentioned that they had learned computer skills from other teachers. Paraprofessionals provided only a few responses which fell into the same categories as those mentioned above.

Best Part of NASON

When asked what was the best part of the NASON Institute, a majority of the teachers mentioned the science skills they had gained, particularly through the chemistry labs. Meeting people, making friends, and interacting with others in a supportive group environment were also common responses. One or two people mentioned learning new approaches to teaching, developing greater self-confidence, working with students and learning computer skills. Students most frequently mentioned recreation and field trips as the best part of NASON but also wrote about meeting people and making friends, being part of a supportive group environment, and learning about other cultures. Paraprofessionals also tended to feel that the best part of the Institute was meeting people and making friends, being part of a supportive group environment, and learning new science skills through the labs.

Worst Part of NASON

The worst parts of the Institute for teachers were sleeping conditions in the dorms, poor guidelines for student conduct, not enough time to accomplish the things they would have liked to do, and disorganization and schedule changes in the program. Several teachers also mentioned that there had not been enough interaction with students, insufficient attention paid to cultural issues or cultural insensitivity and one person found the first few days of the program particularly trying. Paraprofessionals tended to feel that the worst parts of NASON were problems resulting from poor communication, confusion caused by a busy schedule, and the fast pace and hard work required at the Institute. For students, the worst parts of the program were the work, too much separation between the different groups, arguments and dealing with difficult people, disorganization and schedule changes in the program, and the first few days of the program.

Student Careers

In both the pre-test and post-test, students were asked what kind of career they would like to pursue. Responses ran the gamut from marine biologist to high school teacher to movie director. (A complete list can be found in Appendix.6) A number of students changed their responses from pre-test to post-test but these changes did not seem to follow any discernible pattern and generally responses remained quite similar. One surprise was that while six students mentioned they would like to become scientists in the pre-test, none provided this response in the post-test. It should be noted, however, that three of those who provided this initial response did not complete the fourth test and a fourth changed her response from "genetic scientist" to "genetic engineer."

CONCLUSION

Many of the state goals of the NASON Institute seem to have been achieved. Both for teachers and paraprofessionals, their conduct of the classroom and approach to the students seem to have been altered in ways likely to encourage students, particularly Native American students, to learn science. Both teachers and paraprofessionals expressed a willingness to relate the science they are teaching to the lives of their students. Not only what was being taught but how it would be taught was changed by the experience of the Institute. The teachers and paraprofessionals committed to relate science to tribal issues, to careers, and to expose students to Native American role models. Further, they seemed willing (especially the paraprofessionals) to involve parents and community members in the classroom. The nature of instruction would also undergo change. Teachers would have students visually demonstrate their understanding of scientific concepts, brainstorm ideas, and answer "what if" questions. Teachers would also alter their classroom behavior. They would be less likely to call on the first student who raised his/her hand and would pause three seconds before calling on any student. Teachers would also alter the schedule of the classroom day. Lectures and group work would have less time devoted to them, and presentations and experiments would fill more of the instructional time.

Elements of the goals for students were also met. Although these students demonstrated a higher degree of interest in science than originally anticipated by the NASON staff, this interest was further enhanced by their experience at the Institute. They indicated a renewed understanding of science as an important part of their world. Although some lamented about the hard work of the Institute, they felt better prepared to succeed in science and more committed to furthering their education beyond high school. The Institute seemed to have little impact on their learning patterns either alone or as a group with the possible exception of an increased openness to write a paper with a group. Nor did the Institute appear to change measurably their planning for taking science classes in high school.

All three groups seemed to have benefitted from the science and academic content of the Institute. They all expressed agreement with learning principles of science and chemistry, and an enhanced appreciation of Native American history and culture. Indeed the majority of teachers felt that the science skills that they had learned, particularly through the laboratories, were the best part of the Institute. Computer skills were learned but to a lesser extent than the others and was the only content area pointed out for improvement, particularly by teachers. All the groups agreed that they had felt comfortable working with each other.

In addition to the science skills identified by the teachers, participants generally felt that the camaraderie developed between the groups and individual participants was the best part of the Institute. For many students, the field trips and recreational outings opened up new vistas and were valued. For some, the Institute helped build self-confidence. One teacher summarized his experience by saying that the best part of the Institute was . . .

1) the opportunity to increase my knowledge, both content-wise and "teaching tips"-wise -- I can better teach my students. 2) the opportunity to gain a base of knowledge in a new, and, to me, unknown area -- and guidance as to how I can build on that knowledge.

Although the Institute enjoyed general success, problems did emerge as would be expected in any relatively new venture. Many participants were frustrated with problems with the schedule during the early part of the Institute. Others had more specific complaints about the physical arrangements; beds being too hard, or the dorms being too loud, or participants eating too much.

Finally, some changes in the structure of the Institute may increase the attainment of its goals. Participants indicated a desire to work together across group lines beginning with the first week of the Institute. This may have benefit later on as mixed groups work toward completing a project. Further, a recognition of the differences in the central goal established for teachers and paraprofessionals and the goal established for students. Although complimentary, they are different. Perhaps it would be appropriate to break the groups up for some sessions. Sessions that are of interest to teachers like "Grant Writing" could be offered simultaneously with one for students such as "Applying for Scholarships".

In total, the 1995 NASON Summer Institute was largely successful and met the goals established by the leadership. The result seemed to be providing schools throughout the region with teachers and paraprofessional who are better prepared academically and wholly committed to teaching science to Native American students. They are better able to understand the rich mix of history and culture of the Native American community and how it can contribute to making science come alive to these and all other students. Native American high school students also benefited from the Institute by becoming better prepared for their study of science. They seemed to catch a glimpse of how science was integrated not only into their own lives but into the life of their tribe and community. They indicated a new energy to continue their education both in high school and beyond.

BEST COPY AVAILABLE

APPENDICES

Native American Science Outreach Network (NASON) Summer Institute - 1995
STUDENT QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this code because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later in the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. What are your educational plans? (Check one.)
   - [1] ☐ I won't finish high school.
   - [2] ☐ Finish high school but not continue education
   - [3] ☐ After high school, go to Vocational School
   - [4] ☐ After high school, go to Community College
   - [5] ☐ After high school, go to Four-Year College
   - [6] ☐ Other: _____
   - [7] ☐ I don't really know yet.

2. What is the highest degree you hope to attain? (Check one.)
   - [1] ☐ High School Diploma
   - [2] ☐ AA Degree (Community College)
   - [3] ☐ Bachelor's Degree (4-Year College)
   - [4] ☐ Master's Degree
   - [5] ☐ Ph. D. (Doctor of Philosophy)
   - [6] ☐ MD (Doctor of Medicine)
   - [7] ☐ Other: _____

3. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My parents would like me to study science.	SA	A	N	D	SD
Science is boring to me.	SA	A	N	D	SD
What I learn in science does not relate to my life.	SA	A	N	D	SD
Scientific research can be done equally well by Native Americans and non-Natives.	SA	A	N	D	SD
My tribe has no use for science or technology.	SA	A	N	D	SD
No matter how hard I work, I lack the natural ability to do well in science.	SA	A	N	D	SD
Science helps me understand the world around me.	SA	A	N	D	SD
I think Native Americans are not as capable as other people in science.	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
I would be content just taking the minimum science requirements for high school.	SA	A	N	D	SD
I believe that studying science is important for me personally.	SA	A	N	D	SD
My family does not want me to go to college.	SA	A	N	D	SD
Science helps me understand myself.	SA	A	N	D	SD
I believe that science will help members of my family and my tribe to have a better life.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
I am interested in a career in science or engineering.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
If I work hard, I can do well in science.	SA	A	N	D	SD
I am interested in science.	SA	A	N	D	SD

BEST COPY AVAILABLE

4. In school you work on many types of assignments. For each description below, check the box that shows how you would best like to work on the assignment:

Type of Assignment	Alone	With a group	With a couple of close friends	With family members
General homework	[1]☐	[2]☐	[3]☐	[4]☐
Studying for a test	[1]☐	[2]☐	[3]☐	[4]☐
Writing a paper	[1]☐	[2]☐	[3]☐	[4]☐
Working on a science project	[1]☐	[2]☐	[3]☐	[4]☐
Reading a book or paper	[1]☐	[2]☐	[3]☐	[4]☐
Doing library research	[1]☐	[2]☐	[3]☐	[4]☐

5. Do you plan to take any science classes in high school? [1]☐ **Yes** [2]☐ **No**

If your answer is "yes", circle as many of the classes below as you intend to take.

[1]Agricultural Science [2]Biology
[3]Chemistry [4]Earth Science
[5]Environmental Science [6]Physics
[7]Other: _____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. I feel welcome in a classroom when _____

7. The best things about studying science are _____

8. The worst things about studying science are _____

9. If I could have any job I wanted, I would be _____

10. Things I would like to learn but am never taught are _____

11. Skills and knowledge I would like to share with others at the Institute include _____

12. Things I would really like to learn from the NASON Institute are _____

Native American Science Outreach Network (NASON) Summer Institute - 1995
TEACHER QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this code because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later during the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

Please indicate your racial/ethnic identification. (Check all that apply.)

[1] ☐ African American
[2] ☐ Alaskan Native
[3] ☐ Native American
[4] ☐ Asian or Pacific Islander
[5] ☐ Hispanic/Latino
[6] ☐ Caucasian (Not of Hispanic Origin)

1. For each of the following items, please circle the response that best represents how often the following statements describe your science class.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy teaching science.	MT	F	S	AN
I have students apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
I have students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	MT	F	S	AN
I ask students hypothetical "What if . . . ?" questions	MT	F	S	AN
I wait at least 3 seconds before calling on a student.	MT	F	S	AN
I have students brainstorm ideas.	MT	F	S	AN
I call on the first student who raises his/her hand.	MT	F	S	AN
I relate what we are studying to tribal issues.	MT	F	S	AN
I relate what we are studying to careers.	MT	F	S	AN
I ask students to explain how they arrived at an answer.	MT	F	S	AN
Students are exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members help or teach in the classroom.	MT	F	S	AN

2. For how many years have you been teaching science in middle or high school? _____ years.

BEST COPY AVAILABLE

3.. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	SA	A	N	D	SD

4. Considering the list below, divide your typical teaching day by the type of activity. Your total should equal 100%.

Lecture	____%
Teacher demonstration	____%
Class discussion	____%
Small group work	____%
Student presentation	____%
Experiment / Hands-On Activity	____%
Other: _____	____%

5. Do you integrate science with Native American culture in your classroom? [1] ☐ Yes [2] ☐ No

If yes, please give an example of how you combine your science teaching with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. To make Native American students feel welcome in the classroom, I _____

_____

_____

_____

_____

_____

7. In teaching science my overall goals for students are _____

_____

_____

_____

_____

_____

8. The most effective things I do when teaching science to Native American students are _____

9. The biggest problems I encounter when teaching science to Native American students are _____

10. Skills and knowledge I would like to share with others at the Institute include _____

11. Things I would really like to learn from the NASON institute include _____

Native American Science Outreach Network (NASON) Summer Institute - 1995
PARAPROFESSIONAL QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this word because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later in the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items . please circle the response that best represents how often the following statements describe the classes where you have worked.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy assisting in teaching science.	MT	F	S	AN
Students in the classes I assist are asked to apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
These students are asked to brainstorm ideas.	MT	F	S	AN
In these classes the first student who raises his/her hand is called on.	MT	F	S	AN
What we are studying is related to tribal issues in the classes where I work.	MT	F	S	AN
What we are studying is related to careers.	MT	F	S	AN
Students are asked to explain how they arrived at an answer.	MT	F	S	AN
Students are exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members help or teach in the classroom.	MT	F	S	AN

2. For how many years have you been a paraprofessional? _____ years.

3. What is your present educational level? (Check one.)

[1] ☐ Some High School
[2] ☐ High School Diploma
[3] ☐ AA Degree (Community College)
[4] ☐ Bachelor's Degree
[5] ☐ Master's Degree
[6] ☐ Doctorate (Ph. D., M.D.)
[7] ☐ Other: _____

4. What is the highest degree you hope to attain? (Check one.)

[1] ☐ High School Diploma
[2] ☐ AA Degree (Community College)
[3] ☐ Bachelor's Degree (4-Year College)
[4] ☐ Master's Degree
[5] ☐ Ph. D. (Doctor of Philosophy)
[6] ☐ M.D. (Doctor of Medicine)
[7] ☐ Other: _____

5. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to help teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important to me to understand Native American history and culture in order to be a better helper for my students.	SA	A	N	D	SD
My tribe has no use for science or technology	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
I believe that studying science is important for Native American students.	SA	A	N	D	SD

6. In the classes where you work, is science integrated with Native American culture? [1] ❑ Yes [2] ❑ No

If yes, please give an example of how science teaching is combined with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

7. To make Native American students feel welcome in the classroom, I _____

_____

_____

_____

_____

_____

8. The most effective things I do when helping teach Native American students are _____

_____

_____

_____

_____

_____

6. The most effective things I could do when helping teach Native American students will be _____

_____

_____

_____

7. During the Institute, you have had the opportunity to interact with several different groups of people. What are the most important things you have learned from . . .

a) Teachers - _____

_____

_____

b) Students - _____

_____

_____

c) Other paraprofessionals - _____

_____

_____

8. The best part of the Institute for me personally and professionally was _____

_____

_____

_____

9. The worst part of the Institute for me was _____

_____

_____

_____

6. In teaching science my overall goals for students are _____

7. The most effective things I could do when teaching science to Native American students are _____

8. During the Institute, you have had the opportunity to interact with several different groups of people. What are the most important things you have learned from . . .

a) Students - _____

b) Paraprofessionals - _____

c) Other teachers - _____

9. The best part of the Institute for me personally and professionally was _____

10. The worst part of the Institute for me was _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1995

TEACHER QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items, please circle the response that best represents how often the following statements are likely to describe science classes you teach in the future.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy teaching science.	MT	F	S	AN
I will have students apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
I will have students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	MT	F	S	AN
I will ask students hypothetical "What if . . . ?" questions	MT	F	S	AN
I will wait at least 3 seconds before calling on a student.	MT	F	S	AN
I will have students brainstorm ideas.	MT	F	S	AN
I will call on the first student who raises his/her hand.	MT	F	S	AN
I will relate what we are studying to tribal issues.	MT	F	S	AN
I will relate what we are studying to careers.	MT	F	S	AN
I will ask students to explain how they arrived at an answer.	MT	F	S	AN
Students will be exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members will help or teach in the classroom.	MT	F	S	AN

BEST COPY AVAILABLE

2. **For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.**

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	SA	A	N	D	SD
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D	SD
Through this Institute, I have gained a greater appreciation for Native American history and culture.	SA	A	N	D	SD
Through this Institute, I have learned new computer skills.	SA	A	N	D	SD
Through this Institute, I have learned principles of chemistry.	SA	A	N	D	SD
I felt comfortable working in groups with the paraprofessionals and students.	SA	A	N	D	SD
The Institute has taught me techniques for teaching Native American students effectively.	SA	A	N	D	SD
Through the Institute, I have learned better ways to communicate with the parents of my students.	SA	A	N	D	SD
The Institute has taught me ways to connect the science I teach to the everyday lives of my students.	SA	A	N	D	SD

3. Considering the list below, divide what you envision as a typical teaching day next year by the type of activity. Your total should equal 100%.

Lecture _____%
Teacher demonstration _____%
Class discussion _____%
Small group work _____%
Student presentation _____%
Experiment / Hands-On Activity _____%
Other: _____ _____%

4. Do you intend to integrate science with Native American culture in your classroom? [1]❑ **Yes** [2]❑ **No**
If yes, please give an example of how you might combine your science teaching with Native American culture.

_____
_____
_____
_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

5. To make Native American students feel welcome in the classroom next year, I will _____

_____
_____
_____

9. The biggest problems I encounter when helping teach Native American students are _____

10. Things I think should be taught but are not taught in my school are _____

11. Skills and knowledge I would like to share with others at the Institute include _____

12. Things I would really like to learn from the NASON institute include _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1995
STUDENT QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. What are your educational plans? (Check one.)
   - [1] ☐ I won't finish high school.
   - [2] ☐ Finish high school but not continue education
   - [3] ☐ After high school, go to Vocational School
   - [4] ☐ After high school, go to Community College
   - [5] ☐ After high school, go to Four-Year College
   - [6] ☐ Other: _____
   - [7] ☐ I don't really know yet.

2. What is the highest degree you hope to attain? (Check one.)
   - [1] ☐ High School Diploma
   - [2] ☐ AA Degree (Community College)
   - [3] ☐ Bachelor's Degree (4-Year College)
   - [4] ☐ Master's Degree
   - [5] ☐ Ph. D. (Doctor of Philosophy)
   - [6] ☐ MD (Doctor of Medicine)
   - [7] ☐ Other: _____

3. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My parents would like me to study science.	SA	A	N	D	SD
Science is boring to me.	SA	A	N	D	SD
What I learn in science does not relate to my life.	SA	A	N	D	SD
Scientific research can be done equally well by Native Americans and non-Natives.	SA	A	N	D	SD
My tribe has no use for science or technology.	SA	A	N	D	SD
No matter how hard I work, I lack the natural ability to do well in science.	SA	A	N	D	SD
Science helps me understand the world around me.	SA	A	N	D	SD
I think Native Americans are not as capable as other people in science.	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
I would be content just taking the minimum science requirements for high school.	SA	A	N	D	SD
I believe that studying science is important for me personally.	SA	A	N	D	SD
My family does not want me to go to college.	SA	A	N	D	SD
Science helps me understand myself.	SA	A	N	D	SD
I believe that science will help members of my family and my tribe to have a better life.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
I am interested in a career in science or engineering.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
If I work hard, I can do well in science.	SA	A	N	D	SD
I am interested in science.	SA	A	N	D	SD

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D	SD
Through this Institute, I have gained a greater appreciation of my Native American heritage.	SA	A	N	D	SD
Through this Institute, I have learned new computer skills.	SA	A	N	D	SD
Through this Institute, I have learned principles of chemistry.	SA	A	N	D	SD
Because of the Institute, I am eager to continue my schooling.	SA	A	N	D	SD
I felt comfortable working in groups with the teachers and paraprofessionals.	SA	A	N	D	SD
The Institute did not increase my appreciation of science.	SA	A	N	D	SD
During the Institute, I learned many laboratory skills.	SA	A	N	D	SD
I now feel better prepared to be successful in science.	SA	A	N	D	SD
During the Institute, I have learned valuable study skills.	SA	A	N	D	SD
Because of the Institute, I have a better understanding of how science can be used in everyday life.	SA	A	N	D	SD
Through the Institute, I understand the scientific basis of the way things work in the environment.	SA	A	N	D	SD

4. In school you work on many types of assignments. For each description below, check the box that shows how you would best like to work on the assignment:

Type of Assignment	Alone	With a group	With a couple of close friends	With family members
General homework	[1]☐	[2]☐	[3]☐	[4]☐
Studying for a test	[1]☐	[2]☐	[3]☐	[4]☐
Writing a paper	[1]☐	[2]☐	[3]☐	[4]☐
Working on a science project	[1]☐	[2]☐	[3]☐	[4]☐
Reading a book or paper	[1]☐	[2]☐	[3]☐	[4]☐
Doing library research	[1]☐	[2]☐	[3]☐	[4]☐

5. Do you plan to take any science classes in high school? [1]☐ Yes [2]☐ No

If your answer is "yes", circle as many of the classes below as you intend to take.

[1]Agricultural Science [2]Biology
[3]Chemistry [4]Earth Science
[5]Environmental Science [6]Physics
[7]Other: _____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. The best things about studying science are _____

_____

_____

_____

7. The worst things about studying science are _____

_____

_____

_____

8. If I could have any job I wanted, I would be _____

9. Things I would like to learn but am never taught are _____

10. The most important things I learned from the NASON Institute are _____

11. During the Institute, you have had the opportunity to interact with several different groups of people. What are the most important things you have learned from . . .

a) Teachers - _____

b) Paraprofessionals - _____

c) Other students - _____

12. The best part of the Institute for me was _____

12. The worst part of the Institute for me was _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1995
PARAPROFESSIONAL QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items , please circle the response that best represents how often you think the following statements ought to describe the classes where you work in the future..

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy assisting in teaching science.	MT	F	S	AN
Students in the classes I assist should be asked to apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
These students should be asked to brainstorm ideas.	MT	F	S	AN
In these classes the first student who raises his/her hand should be called on.	MT	F	S	AN
What we are studying should be related to tribal issues in the classes where I work.	MT	F	S	AN
What we are studying should be related to careers.	MT	F	S	AN
Students should be asked to explain how they arrived at an answer.	MT	F	S	AN
Students should be exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members should help or teach in the classroom.	MT	F	S	AN

2. What is the highest degree you hope to attain? (Check one.)

[1] ☐ High School Diploma
[2] ☐ AA Degree (Community College)
[3] ☐ Bachelor's Degree (4-Year College)
[4] ☐ Master's Degree
[5] ☐ Ph. D. (Doctor of Philosophy)
[6] ☐ M.D. (Doctor of Medicine)
[7] ☐ Other: _____

BEST COPY AVAILABLE

3. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to help teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important to me to understand Native American history and culture in order to be a better helper for my students.	SA	A	N	D	SD
My tribe has no use for science or technology	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
I believe that studying science is important for Native American students.	SA	A	N	D	SD
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D	SD
Through this Institute, I have gained a greater appreciation for Native American history and culture.	SA	A	N	D	SD
Through this Institute, I have learned new computer skills.	SA	A	N	D	SD
Through this Institute, I have learned principles of chemistry.	SA	A	N	D	SD
I felt comfortable working in groups with the paraprofessionals and students.	SA	A	N	D	SD
The Institute has taught me techniques for teaching Native American students effectively.	SA	A	N	D	SD
Through the Institute, I have learned better ways to communicate with the parents of my students.	SA	A	N	D	SD
The Institute has taught me ways to connect the science I teach to the everyday lives of my students.	SA	A	N	D	SD

4. Please give an example of how science teaching might be combined with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

5. To make Native American students feel welcome in the classroom, I will _____

_____

_____

_____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1995

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

I. We are interested in your opinions about how useful the events of the Institute were to you. Please circle the number that best represents your reaction to the listed event. The range is from one (1) to five (5) with 1 being "not at all useful" and 5 being "extremely useful".

NASON Event Evaluation

Week		Event/Activity	1=Not at all useful	2=Not very useful	3=Neutral	4=Some-what useful	5=Very useful
Week 1	a)	Check in and campus tours	1	2	3	4	5
	b)	Opening activities at Faculty Club	1	2	3	4	5
	c)	Elders at Faculty Club	1	2	3	4	5
	d)	What is science? (Sara, James Nason, Chris Morganroth & Gene Hunn)	1	2	3	4	5
	e)	Library resources - getting to know the campus	1	2	3	4	5
	f)	Burke Museum tour - getting to know the campus	1	2	3	4	5
	g)	Simulation presentation (Sara, Rand Little (Water Dept.), John Schmied)	1	2	3	4	5
	h)	Simulation Jigsaws	1	2	3	4	5
	i)	Discovery Park	1	2	3	4	5
	j)	Laboratories with Richard and Anne	1	2	3	4	5
	k)	Demo night	1	2	3	4	5
	l)	Writing with Ned	1	2	3	4	5
Week 2	a)	Computer instruction with Chris	1	2	3	4	5
	b)	Laboratories with Anne and Richard	1	2	3	4	5
	c)	Simulation Jigsaws	1	2	3	4	5
	d)	Water testing - trip to Cedar River Watershed	1	2	3	4	5
	e)	Archaeology talk - trip to Cedar River Watershed	1	2	3	4	5
	f)	Water Dept. talks - trip to Cedar River Watershed	1	2	3	4	5
	g)	Swimming hole - trip to Cedar River Watershed	1	2	3	4	5
	h)	Simulation team research	1	2	3	4	5
	i)	Team reporting sessions	1	2	3	4	5
	j)	Writing with Ned	1	2	3	4	5
Week 3	a)	Laboratories with Richard and Anne	1	2	3	4	5
	b)	Simulation team research	1	2	3	4	5
	c)	Baseball game	1	2	3	4	5
	d)	Bristol-Myers Squibb trip	1	2	3	4	5
	e)	Science Center	1	2	3	4	5

(Over)

Week 3 *(cont'd.)*	a)	Mini-session on Resource Guide on CD-ROM	1	2	3	4	5
	b)	Grant writing with Nan - mini-session	1	2	3	4	5
	c)	Spectrum boxes - mini-session	1	2	3	4	5
	d)	Sherman Alexie	1	2	3	4	5
	e)	Bear & Deb Parker community issues meeting	1	2	3	4	5
	f)	Team reporting sessions	1	2	3	4	5
	g)	Basket project with Philip	1	2	3	4	5
	h)	National & State science standards with Sara	1	2	3	4	5
	i)	Pitfalls in the classroom, student, teacher , & paraprofessional	1	2	3	4	5
	j)	Canoe water testing	1	2	3	4	5
	k)	College scholarships with Julian & Scotty	1	2	3	4	5
	l)	Writing with Ned	1	2	3	4	5
	m)	Global Climate Change, Richard Gammon	1	2	3	4	5
Week 4	a)	Laboratories with Anne and Richard	1	2	3	4	5
	b)	Team work on simulation	1	2	3	4	5
	c)	Grants session with Nan	1	2	3	4	5
	d)	Seven Intelligence's with Richard	1	2	3	4	5
	e)	Project Presentation to full group and guests	1	2	3	4	5
	f)	Student issues reports	1	2	3	4	5

II. Please list your five (5) favorite evening activities.

1) _____

2) _____

3) _____

4) _____

5) _____

III. What other activities or events would you like to see included in the Institute.

_____

_____

_____

_____

IV. Were there any member of the NASON staff who made special contributions to your experience at the Institute? If so who were they and what did they do? _____

_____

_____

_____

V. Were there any members of the NASON staff who inhibited your learning or experience at the Institute? If so, what did they do or not do? (Names are not necessary.) _____

_____

_____

_____

PRESENTATION EVALUATION

A major element of the NASON Institute is the group presentations. In the following series of statements, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1) As a member of my presentation team, I took a leadership role.	SA	A	N	D	SD
2) As a member of my presentation team, I took initiative to do things.	SA	A	N	D	SD
3) As a member of my presentation team, I listened to other members and took their opinions into account.	SA	A	N	D	SD
4) I did not feel connected to the other members of my presentation team.	SA	A	N	D	SD
5) Members of our presentation team worked together with enthusiasm.	SA	A	N	D	SD
6) Members of our presentation team worked individually rather than as a group.	SA	A	N	D	SD
7) I got along well with the other members of my presentation team.	SA	A	N	D	SD
8) Teachers, paraprofessionals, and students worked well together in my group.	SA	A	N	D	SD
9) The work that my group did was interesting and useful for the people at the Institute.	SA	A	N	D	SD
10) The work that my group did was interesting to me.	SA	A	N	D	SD
11) The work that my group did will be useful to me when I return home.	SA	A	N	D	SD
12) The audience found our presentation interesting and useful.	SA	A	N	D	SD
13) Our team's presentation before the audience went very well.	SA	A	N	D	SD
14) Our group's presentation was well organized.	SA	A	N	D	SD
15) Our group's presentation contributed to the general project in a positive way.	SA	A	N	D	SD
16) Our group's presentation could have been improved in useful ways.	SA	A	N	D	SD
17) The presentations made by other groups were well organized.	SA	A	N	D	SD
18) The presentations made by other groups were interesting to watch.	SA	A	N	D	SD
19) The presentations made by other groups contributed to the general project.	SA	A	N	D	SD
20) I learned a lot from the discussion following the presentations.	SA	A	N	D	SD
21) The discussion after the presentations was boring.	SA	A	N	D	SD
22) The discussion after the presentations was too long.	SA	A	N	D	SD
23) Our presentation team had a dynamic leader.	SA	A	N	D	SD
24) In our presentation team everyone contributed equally and there was no single leader.	SA	A	N	D	SD
25) The discussion was an important part of the general project.	SA	A	N	D	SD

Event and Activities Rating by Means Sorted by the Total for All Groups

Item	Paraprof.	Student	Teacher	Total (all groups)
Number Responding	6	10	17	33
Laboratories 1	5.00	4.20	4.67	4.59
Demo Night	4.67	4.80	4.33	4.53
Project Presentation	5.00	4.20	4.50	4.50
Laboratories 3	4.83	4.00	4.59	4.45
Laboratories 4	4.83	3.90	4.53	4.39
Sherman Alexie	4.60	4.40	4.31	4.39
Simulation Jigsaws 1	4.67	3.90	4.56	4.38
Laboratories 2	4.83	4.00	4.44	4.38
Discovery Park	4.33	4.40	4.33	4.35
Simulation Jigsaws 2	4.50	3.80	4.56	4.31
Simulation presentation	4.67	3.90	4.33	4.26
Seven Intelligences	4.25	4.20	4.30	4.25
Water testing - Cedar River	4.67	3.90	4.29	4.24
Science Center	3.83	4.80	3.94	4.18
Spectrum boxes	4.33	3.88	4.25	4.17
Simulation team research 2	4.67	3.60	4.29	4.15
Team work on simulation	4.83	3.60	4.24	4.15
Canoe water testing	4.20	4.11	4.15	4.15
Swimming hole - Cedar River	3.83	4.11	4.11	4.06
Grant writing	4.33	3.13	4.35	4.03
"What is Science?"	4.33	3.80	4.00	4.00
Writing 1	4.50	4.10	3.63	4.00
Pitfalls in the classroom	4.67	3.25	4.08	3.97
Baseball game	4.00	4.40	3.67	3.97
Library Resources	3.83	3.50	4.17	3.91
Writing 2	4.00	4.10	3.63	3.91
Global Climate Change	4.17	3.33	4.13	3.90
Water Dept. talk - Cedar River	3.50	3.50	4.22	3.88
Check-in & Tour	4.17	3.70	3.88	3.88
Simulation team research 1	4.33	3.44	3.88	3.84
Parkers' community issues	3.50	4.00	3.69	3.78
College scholarships	3.50	4.11	3.60	3.76
Elders at Faculty Club	4.50	3.60	3.60	3.76
Student Issues Reports	4.33	4.00	3.38	3.75
Grants session	4.33	3.11	3.88	3.74
Writing 3	3.50	4.10	3.00	3.65
Burke Tour	3.50	3.20	3.89	3.62

(con't.)

Event and Activities Rating by Means Sorted by the Total for All Groups (con't)				
Item	Paraprof.	Student	Teacher	Total (all groups)
Bristol-Myers Squibb trip	3.50	3.70	3.50	3.60
Basket project	3.40	3.40	3.79	3.59
Archaeology talk - Cedar River	3.17	3.30	3.78	3.53
Computer instruction	4.00	4.30	2.89	3.50
Opening at Faculty Club	4.33	3.20	3.33	3.47
Team reporting 1	3.83	3.20	3.33	3.38
National & State science standards	3.67	3.38	3.13	3.31
Team reporting sessions 2	3.83	3.20	3.12	3.27
Resource Guide on CD-ROM	3.33	3.67	2.69	3.14

Question 4: If I could have any job I wanted, I would be . . . .

	Pre-Institute	Post-Institute
Student 1	an architectural designer.	an architectural drafter or a graphic(sic) designer.
Student 2	right now I'd have to say a high school anatomy/physiology teacher.	a high school teacher that makes a six digit salary.
Student 3	a biologist who had published several books on animal rights.	a veterinarian who had several books published about her experiences and philosophy.
Student 4	own my own beauty salon and all that.	an artist.
Student 5	in a position doing what I liked.	some sort of engineer maybe.
Student 6	a chemist, or a cook. But for now I would enjoy studying all kinds of science and hope to major in chemistry.	an artist, a chef, or a school teacher teaching high school science class.
Student 7	a chemical engineer or a genetic scientist.	genetic engineer.
Student 8	I feel that I would want to be a sports medicine Dr.	a sports medicine Dr.
Student 9	a zookeeper in a large zoo.	a zookeeper in a large zoo. I would feed and take care of the newborn animals.
Student 10	an actress or a director.	???
Student 11	my own arcade, so that the kids in Lahalah would have somewhere to go and have fun instead of hanging out on the street.	a high school basketball coach.
Student 12	a movie or rap star.	president of a multi-billion dollar company.
Student 13	to work in the Tribal fisheries.	chemical engineer.
Student 14	an evangelist and a person that goes out to National park and stuff to check on the animals.	an evangelist and a park ranger (volunteer).
Student 15	a genetic engineer or a science teacher.	teacher.
Student 16	a pediatric anesthesiologist, a chemical engineer, or an emergency room doctor.	a pediatric anesthesiologist.
Student 17	a writer. I love to voice my opinion, and I also like to write stories with a twist, so that way people will continue to read what I write. I also like poetry, all of the deep thinking that occurs when you write is something else.	a writer. If that can't happen, a lawyer to work in tribal law, to better my community.

Question 4: If I could have any job I wanted, I would be . . . . (con't.)

	Pre-Institute	Post-Institute
Student 18	a school teacher, a police officer, or a photographer.	
Student 19	a biologist for the fish and wildlife dept. for my tribe.	
Student 20	I have a lot of things that I would want. I would most strongly want to become a marine biologist.	
Student 21	FBI	
Student 22	probably a marine biologist or something, I don't quite know what to do with my life and haven't decided what job I want.	
Student 23	a lawyer.	
Student 24		lawyer!!!

University of Washington
Office of Educational Assessment

Gerald M. Gillmore, Ph.D., Director
Nana Lowell, Ph.D., Associate Director
Thomas Taggart, M.Div., Assistant Director

96 - 6

Native American Science Outreach Network (NASON) Summer Institute, 1996 - An Evaluation

Thomas Taggart

October, 1996

The Office of Educational Assessment is an agency of the University of Washington which provides a variety of services related to educational research and assessment. The following are programs within which these services are provided:

- Institutional Research
- Student Outcomes Assessment
- Instructional Evaluation
- Test Scoring and Analysis
- Standardized Testing

BEST COPY AVAILABLE

453 Schmitz Hall, 1400 NE Campus Parkway, University of Washington, PB-30, Seattle, WA 98195
Voice: (206) 543-1170 FAX: (206) 543-3961 E-Mail: oea @u.washington.edu

96 - 6

Native American Science Outreach Network (NASON) Summer Institute, 1996 - An Evaluation

Thomas Taggart

October 1996

INTRODUCTION

For the third consecutive year, the Native American Science Outreach Network (NASON) hosted a Summer Institute. Sponsored by the University of Washington Department of Chemistry, NASON's mission is to assist educators at the high school and middle school levels to engage Native American students in the study of science. It does so by providing teachers and paraprofessionals with resources in the form of both scientific teaching materials and assets related to Native American history and culture. Through these efforts NASON also seeks to encourage Native American students to consider science as both a course of study and a career option. NASON's Summer Institute invites educators to the UW campus to participate in four weeks of enrichment in science teaching and Native American background. They are joined throughout the Institute by a group of Native American middle and high school students. Together the educators and students attend classes, labs, and go on field trips. They also participate in a series of cultural and entertainment activities. At the conclusion of the Institute, groups of teachers and paraprofessionals make presentations and students participate in a science fair.

The NASON Summer Institute was again led by Dr. Sara Selfe (Senior Lecturer in the UW Department of Chemistry). She was assisted by Nan Little (Director of NASON). The leadership of NASON administered three survey instruments to the three participant groups (teachers, paraprofessionals, and students). (See Appendix I - III.) The survey instruments were almost identical to the instruments used in 1995. The Office of Educational Assessment (OEA) agreed to review the results of the surveys and to analyze them in this report.

RESULTS

Demographics

The summer of 1996 was the third year of the NASON Summer Institute. It involved fewer participants than the previous year. Gender distribution was more female than male and all three groups had lower average ages than last year's contingent. (See Table 1.)

BEST COPY AVAILABLE

Table 1: Age and Gender

	1995			1996		
	Male	Female	Avg. Age	Male	Female	Avg. Age
Teachers	12	8	40.3	5	10	35.0
Paraprofessionals	4	5	33.3	0	1	26.0
Students	12	12	16.2	1	10	15.5
Total	28	25	28.2	6	21	26.7

The survey instruments used assumed that students and paraprofessionals were Native American, but asked teachers to identify their ethnic heritage. Table 2 compares the teachers' ethnic self-identifications over the two years.

Table 2: Teacher Ethnicity

	1995	1996
Alaskan Native	1	1
Asian	1	1
Caucasian	14	10
Hispanic/Latino	0	1
Native American	5	2

Paraprofessionals were asked about their educational background and future educational plans. The one respondent in 1996 held an Associate of Arts (AA) degree and that was as far as she wished to go. In 1995, eight paraprofessionals responded: three held high school diplomas, three held AA degrees, one was pursuing an AA degree, and the last was attending a four-year school. The 1995 paraprofessionals were more ambitious than the 1996 participant. Two wished to earn a Bachelor of Arts or Science, five sought master's degrees, and one hoped for a law degree.

Teachers and Paraprofessionals

As in the 1995 surveys, teachers and paraprofessionals were asked to respond to similar statements regarding how their classes were conducted. Statements about the classes were posed and respondents could answer in a range from "Most of the Time" (4) to "Almost Never" (1). Teachers were asked three questions related to how they directed the flow in the classrooms that paraprofessionals were not asked. The full series of questions for both groups was repeated in the questionnaire at the end of the Institute in order to assess the

impact of the Institute on the "style" of teaching or classroom assistance. The means of responses for both 1995 and 1996 are shown in Tables 3 and 4.

4 = Most of the Time 3 = Frequently 2 = Sometimes 1 = Almost Never

Table 3: Teacher Responses - 1995 & 96, Pre- & Post-Institute Surveys

Statement	Teachers Pre-1995	Teachers Post-1995	1995 Change	Teachers Pre-1996	Teachers Post-1996	1996 Change
I enjoy teaching science.	3.05	3.30	0.25	3.00	3.30	0.30
I will have students apply what they are learning to real life situations and to their personal experiences.	2.65	3.25	0.60	2.87	3.50	0.63
I will have students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	2.05	2.95	0.90	2.93	3.10	0.17
I will ask students hypothetical "What if . . ?" questions	2.65	3.30	0.65	3.14	3.40	0.26
I will wait at least 3 seconds before calling on a student.	3.26	3.65	0.39	3.53	3.60	0.07
I will have students brainstorm ideas.	3.20	3.30	0.10	3.20	3.50	0.30
I will call on the first student who raises his/her hand.	2.00	1.75	-0.25	1.67	1.40	-.027
I will relate what we are studying to tribal issues.	2.05	2.75	0.70	2.00	2.90	0.90
I will relate what we are studying to careers.	2.75	3.00	0.25	2.73	3.30	0.57
I will ask students to explain how they arrived at an answer.	2.65	2.95	0.30	3.00	3.10	0.10
Students will be exposed to Native American as well as non-Native role models in science.	1.70	2.80	1.10	2.00	3.00	1.00
Parents or community members will help or teach in the classroom.	1.40	2.35	0.95	2.07	2.89	0.82

BEST COPY AVAILABLE

4 = Most of the Time 3 = Frequently 2 = Sometimes 1 = Almost Never

Table 4: Paraprofessional Responses - 1995 & 96, Pre- & Post-Institute Surveys

Statement	Parapros Pre-1995	Parapros Post-1995	1995 Change	Parapros Pre-1996	Parapros Post-1996	1996 Change
I enjoy assisting in teaching science.	3.00	2.71	-.029	2.00	3.00	1.00
Students in the classes I assist should be asked to apply what they are learning to real life situations and to their personal experiences.	2.50	3.29	0.79	3.00	4.00	1.00
These students should be asked to brainstorm ideas.	2.25	3.43	1.18	3.00	4.00	1.00
In these classes the first student who raises his/her hand should be called on.	2.75	2.29	-0.46	2.00	2.00	0.00
What we are studying should be related to tribal issues in the classes where I work.	1.87	2.86	0.99	3.00	3.00	0.00
What we are studying should be related to careers.	2.86	3.00	0.14	2.00	4.00	2.00
Students should be asked to explain how they arrived at an answer.	2.50	2.86	0.36	3.00	4.00	1.00
Students should be exposed to Native American as well as non-Native role models in science.	1.75	3.43	1.68	3.00	3.00	0.00
Parents or community members will help or teach in the classroom.	1.75	3.14	1.39	2.00	3.00	1.00

The Institute intended to increase behaviors deemed "positive" and to see demonstration of such commitment by changes in ratings in the post-Institute survey. Indeed, there is evidence of improved frequency in these behaviors in teacher and paraprofessionals' responses in both years. In some instances (application of learning to real life, relation of studying to tribal issues and careers, exposure to Native American role models, and involvement of parents and community in the classrooms) the change is relatively large. In others only marginally so. Some larger gains (use of visual aids to demonstrate mastery, and use of hypothetical questions) evidenced in teacher responses in 1995 but not in 1996 could be accounted for because teachers in the second year of the Institute indicated more frequent use of these techniques at the initial survey. Comparison of paraprofessional responses between years is not useful since there was only one paraprofessional in attendance in 1996.

Reactions were also sought from teachers and paraprofessionals to statements about teaching Native American students. The range of response to the four statements was from "Strongly Agree" (5) to "Strongly Disagree" (1). Comparisons of the two years of teacher reactions to the four statements show demonstrable change in only one area. Teachers in both years more strongly agreed that they were confident in their abilities to teach Native American

students at the conclustion of the Institute. For the other three statement agreement was relatively high at the beginning of the Institute and showed very little variance over time. Paraprofessionals in 1995 demonstrated little change in reaction over the course of the Institute and the sole respondent in 1996 felt less confident in her abilities at the conclusion of the Institute. The Results are shown in Tables 5 & 6.

5= Strongly Agree **4** = Agree **3** = Neutral **2** = Disagree **1** = Strongly Disagree

Table 5: Teacher Responses - 1995 & 96, Pre- & Post-Institute Surveys

Statement	Teachers Pre-1995	Teachers Post-1995	1995 Change	Teachers Pre-1996	Teachers Post-1996	1996 Change
I feel confident in my ability to teach science to Native American students.	3.20	4.25	1.05	3.40	4.10	0.70
I think that the family plays a critical role in helping a student achieve academically.	4.60	4.55	-0.05	4.73	4.60	-0.13
It is important for me to develop relationships with the families of Native American students.	4.35	4.50	0.15	4.40	4.22	-0.18
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	4.50	4.65	0.15	4.80	4.80	0.00

Table 6: Paraprofessional Responses - 1995 & 96, Pre- & Post-Institute Surveys

Statement	Parapros Pre-1995	Parapros Post-1995	1995 Change	Parapros Pre-1996	Parapros Post-1996	1996 Change
I feel confident in my ability to teach science to Native American students.	4.00	3.86	-0.14	4.00	5.00	-1.00
I think that the family plays a critical role in helping a student achieve academically.	4.62	4.86	0.24	5.00	5.00	0.00
It is important for me to develop relationships with the families of Native American students.	4.25	4.57	0.32	5.00	5.00	0.00
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	4.75	4.57	-0.18	5.00	5.00	0.00

In a question asked only of teachers in both the pre- and post-Institute surveys, they were asked to describe how a typical teaching day was divided by types of instruction. They were asked to distribute 100% of their classroom time between the following methods of instruction:

Lecture
Teacher demonstration
Class discussion
Small group work
Student presentation
Experiment / Hands-on activity
Other

In the 1995 responses to this question, teachers' distribution of their day differed markedly between the beginning of the Institute and its conclusion. The percentage of time committed to lecture was reduced by half (from 18.43% to 9.63%) as was the amount of the day devoted to group work (from 20.45% to 13.61%). Considerably more time was devoted to experiments and hands-on activity (from 18.42% to 33.00%). In 1996, these changes were not nearly so variable. At the beginning of the Institute, the 1996 teachers already tended to favor use of experiments or hand-on activities and small group work in contrast to more traditional instructional modes such as lecture and teacher demonstration. (See Table 7.)

Table 7: Average Percentage Distribution Teaching Day

	1995 - Pre.	1995 - Post	1996 - Pre.	1996 - Post
Lecture	18.43	9.63	13.00	11.11
Teacher Demonstration	13.55	12.55	9.40	11.67
Class Discussion	15.45	14.75	15.00	15.33
Small Group Work	20.45	13.61	24.57	31.67
Student Presentation	10.67	12.65	9.55	8.67
Experiment/Hands-On	18.42	33.00	27.86	26.25
Other	16.75	11.00	25.00	5.00

Students

As indicated above, there were about half the number of students involved in the 1996 Institute as there were in 1995 (11 vs. 24) and they were nearly a year younger (15.5 vs. 16.2) on average. For a starting point, students were asked their educational plans and what would be the highest degree they hoped to attain. The results of these queries are seen in Table 8 below. The student who chose "other" in educational plan explained an intent to go to a military academy or join the service after which he would attend a four-year college. In 1995 and 1996, there seemed to be overall more moderate expectations at the conclusion of the Institute although this judgment is somewhat tempered by a small response rate.

Table 8: Student's Educational Plans & Goals, Number Responding				
Educational Plans	**1995 - Pre.**	**1995 - Post**	**1996 - Pre.**	**1996 - Post**
Some High School	1			
Vocational School	1	3		
Community College	2	3	1	2
4 Year College	19	12	7	5
Other			1	1
Highest Degree Hoped to Attain	**1995 - Pre.**	**1995 - Post**	**1996 - Pre.**	**1996 - Post**
Bachelor of Arts/Science	8	2	1	1
Masters	4	7	1	2
Ph.D.	8	5	6	2
MD	3	2	2	3
Other		2	1	

Students were next asked to indicate their response to nineteen statements related to their attitudes about science and the relation of science to the Native American community. Some of these statements were adapted from an instrument developed by Catherine Matthews of the University of North Carolina - Greensboro and Walter Smith of the University of Kansas.[1] The NASON version presented students with a Lickert Scale of choices from "Strongly Agree" (5) to "Strongly Disagree" (1). Several statements were negatively posed so that disagreement by the students expressed a positive opinion such as, "My family does not want me to go to college." The mean of responses for both 1995 and 1996 is shown in Table 9.

There exists no standard comparison benchmark for all high school students. Students in both years indicated their parents tended to be indifferent to the study of science (item 1). However, the students' families seemed to want them to go to college (item 12). Students generally were bored with science and were only a little less so by the end of the Institute (item 2). Generally there were two groups of items, those related to students' personal feelings about science (items 3, 6, 7, 10 - 13, and 16 - 19) and those related to science and their community (items 4, 5, 8, 9, 14, and 15). Overall, students in the second year (1996) were slightly more attuned to science. Although they felt more strongly that what they learned in science did not relate to their lives than the 1995 students (item 3), they held more strongly that science helped them understand the world around them (item 7). They felt that studying science was important to them personally (item 11), that it helped them understand themselves (item 13), and that with effort they could do well in science (item 18). Further,

[1] Matthews, C. and Smith, W.S. Native American Related Materials in Elementary Science Instruction, *Journal of Research in Science Teaching*, April 994 Vol. 31 (4) 363-380.

BEST COPY AVAILABLE

they tended to disagree that they had natural science abilities, that they would take the minimum science required in high school, that their families did not want them to go to college, or that science was at odds with their cultural beliefs. Perhaps because the 1996 students seemed to be more in tune initially with the goals that NASON worked to achieve for them, the impact of the Institute was less evident than in 1995.

In the initial questionnaire on statements related to their community, the 1996 students again tended to agree more strongly with positively worded propositions (items 4, 9, 14, and 15) and tended to express stronger disagreement with negatively phrased statements (items 5 and 8). Both the positive and negative statements had to do with Native Americans' involvement in science. However, in two statements related to Native American scientific role models (items 4 and 9), the 1996 students agreed less strongly at the end of the Institute. This may point to a lack of such examples being brought to the students' attention in the classes and workshops.

Comparing the student responses from 1995 with those of 1996 indicates that the 1995 Institute had more impact on the students. However, the smaller number of students participating in 1996 seemed to be more committed to science education and, therefore, may have represented an elite group of students. In essence, the Institute may have been "preaching to the choir" in some of their efforts.

One of the other goals of the Institute was to improve the students' study skills and to explore their learning patterns. As was done in 1995, at the beginning and end of the 1996 Institute, students were asked to indicate how they interacted in certain learning tasks. Students were asked to report whether they would do certain activities alone, with a group, with a couple of close friends, or with family. Comparisons between years and pre- and post-Institutes are shown in Table 10 below. In both years the Institute seemed to have little impact on changing student learning patterns. Because of the small number of respondents and an incomplete return of the post-Institute survey, little can be determined definitively about how student learning patterns may have changed. "Doing library research" was the only area in 1996 that evidenced a shift in students' approach, from a tendency to work alone to a more collaborative approach with either a group or friends.

Student were also asked in both the pre- and post-Institute surveys to indicate whether or not they planned to take science classes in high school. In both years comparing the pre- and post-Institute results is difficult because many students did not respond to the post-Institute survey. The results in Table 11 below show no discernible pattern of change. The 1996 students, who showed in earlier areas of the survey a higher level of motivation toward science, seemed to maintain that interest over the time of the Institute. However, the reduction of numbers of 1996 students planning to take Earth Science classes cannot be explained by the reduced number of responses to the post-Institute survey.

5= Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

Table 9: Student Attitudes About Science

Statement	Students 1995-Pre	Students 1995-Post	1995 Change	Students 1996-Pre	Students 1996-Post	1996 Change
1. My parents would like me to study science.	2.48	2.39	-0.09	2.18	2.25	0.07
2. Science is boring to me.	4.13	3.94	-.19	4.55	4.25	-0.30
3. What I learn in science does not relate to my life.	3.65	4.00	0.35	4.55	4.57	0.02
4. Scientific research can be done equally well by Native Americans and non-Natives.	4.61	4.60	-0.01	4.91	4.50	-0.41
5. My tribe has no use for science or technology.	1.26	1.47	0.21	1.27	1.38	0.11
6. No matter how hard I work, I lack the natural ability to do well in science.	2.13	2.44	0.31	1.82	1.71	-0.11
7. Science helps me understand the world around me.	3.96	4.00	0.04	4.10	4.00	-0.10
8. I think Native Americans are not as capable as other people in science.	1.43	1.50	0.07	1.64	1.25	-0.39
9. Native Americans have made important scientific discoveries.	4.17	4.33	0.16	4.18	3.38	-0.80
10. I would be content just taking the minimum science requirements for high school.	2.30	2.17	-0.13	2.09	2.38	0.29
11. I believe that studying science is important for me personally.	3.74	4.00	0.26	4.18	4.13	-0.05
12. My family does not want me to go to college.	1.18	1.11	-0.07	1.45	1.57	0.12
13. Science helps me understand myself.	3.52	3.56	0.04	3.60	4.00	0.40
14. I believe that science will help members of my family and my tribe to have a better life.	4.00	3.78	-0.22	4.09	4.57	0.48
15. All Americans -- regardless of ethnicity -- have the same need to study science in high school.	3.91	4.22	0.31	4.64	4.86	0.22
16. I am interested in a career in science or engineering.	3.70	3.94	0.24	3.82	3.43	-0.39
17. Science is at odds with my cultural beliefs.	2.26	2.22	-0.04	2.64	2.14	-0.50
18. If I work hard, I can do well in science.	4.13	4.35	0.22	4.91	4.33	-0.58
19. I am interested in science.	4.09	4.29	0.20	4.45	4.33	-0.12

Table 10: Learning patterns of Students - Alone vs. Groups

Task	Option	Pre-1995	Post - 1995	Pre-1996	Post - 1996
General homework	Alone	11	9	6	6
	With a group	5	4	2	0
	With a couple of close friends	6	4	3	0
	With family members	1	1	0	0
Studying for a test	Alone	6	6	3	5
	With a group	7	4	2	0
	With a couple of close friends	9	6	5	0
	With family members	0	1	1	1
Writing a paper	Alone	17	8	8	5
	With a group	1	4	1	0
	With a couple of close friends	3	3	0	1
	With family members	1	2	2	0
Working on a science project	Alone	1	1	1	1
	With a group	10	7	4	1
	With a couple of close friends	11	8	5	4
	With family members	0	1	1	0
Reading a book or paper	Alone	19	15	11	5
	With a group	1	2	0	0
	With a couple of close friends	2	0	0	1
Doing library research	Alone	11	9	6	2
	With a group	5	3	3	2
	With a couple of close friends	5	5	1	2
	With family members	1	0	1	0

Table 11: Science Classes Students Plan to Take

Class	Pre-1995	Post - 1995	Pre-1996	Post - 1996
Agricultural Science	4	3	2	0
Biology	18	13	7	5
Chemistry	17	17	8	5
Earth Science	11	6	6	1
Environmental Science	6	4	2	2
Physics	10	10	3	3
Other	2	2	2	2

Institute Impact on Participants

At the conclusion of both the 1995 and 1996 Institutes, participants were asked to react to statements regarding the impact of the Institute. Six statements were common to all three groups of participants, two more were specific to teachers and paraprofessionals, and six were exclusively offered to students for response. Comparisons between the years (shown in Table 12), indicate that for the statements common to all three groups the 1996 Institute was rated more highly than the 1995 Institute in providing understanding of scientific principles, and comfort in working with other groups. Students in 1996 more strongly agreed that the Institute taught them new computer skills and principles of chemistry than did their predecessors in 1995. Teachers in 1996 were only slightly more in agreement that they had learned new computer skills and less in agreement about learning chemistry principles than they were in 1995. For statements regarding Native American teaching effectiveness and communicating with parents, the 1996 Institute did not fare nearly as well as 1995. In fact, teachers tended to disagree that they had learned better ways to communicate with the parents of their Native American students. However, the students' responses to the statements specific to them were overwhelmingly positive except to the one negatively posed statement to which they reacted with strong disagreement thereby indicating that the Institute had increased their appreciation of science. (In 1996, only one paraprofessional responded so comparison for this group is not valid.)

In summary, it would seem that the 1996 Institute was much stronger in meeting its academic goals of educating participants in science related areas than it was in 1995. It was also somewhat less successful in meeting some of the relational goals of teaching techniques specific to Native American students and communicating with family. Based on students' reactions, the Institute certainly seemed to provide both academic motivation and a sense of competency.

Participants were also asked to rate all 46 events of the NASON Institute on a scale from 5 (very useful) through 1 (not at all useful). The ranking of these events is shown in Table 13. What is noticeable about the listing is that all events received "useful" ratings including a baseball game. Most activities were ranked between "somewhat useful" and "very useful." As a type of event, laboratories were consistently ranked close to the top of the scale. The student science fair was also found to be "very useful" both by the students and the teachers.

When asked what other activities should be part of the Institute, respondents expressed a desire for more Native American cultural presentations and tie-ins to science. Others asked for more time for teachers to collaborate and share information. A few wanted more recreational activities including canoeing, laser shows, and a trip to Blake Island.

BEST COPY AVAILABLE

5= Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

Table 12: Impact of the Institute

	Students		Teachers		Paraprofessionals	
	1995	1996	1995	1996	1995	1996
Through this Institute, I have gained a greater understanding of scientific principles.	4.22	4.33	4.30	4.50	4.43	4.00
Through this Institute, I have gained a greater appreciation for Native American history and culture.	4.11	4.17	4.20	4.20	4.33	5.00
Through this Institute, I have learned new computer skills.	3.94	4.50	3.60	3.90	3.71	3.00
Through this Institute, I have learned principles of chemistry.	4.14	4.67	4.40	4.30	3.86	4.00
I felt comfortable working in groups with the other groups (paraprofessionals, teachers or students).	4.00	4.67	4.30	4.44	4.71	4.00
The Institute has taught me ways to connect the science I teach to the everyday lives of my students.	3.94	4.50	4.15	4.00	3.86	4.00
The Institute has taught me techniques for teaching Native American students effectively.			3.90	3.20	3.86	5.00
Through the Institute, I have learned better ways to communicate with the parents of my students.			3.20	2.89	3.71	5.00
Because of the Institute, I am eager to continue my schooling.	4.00	4.50				
The Institute did **not** increase my appreciation of science.	2.28	1.17				
During the Institute, I learned many laboratory skills.	3.72	4.83				
I now feel better prepared to be successful in science.	4.11	4.50				
During the Institute, I have learned valuable study skills.	3.65	4.33				
Through the Institute, I understand the scientific basis of the way things work in the environment.	3.94	4.50				

Table 13: Event Ranking Activity	Overall Average	Parapro. Rating	Students' Average	Teachers' Average
Water Dept. Talks - Trip to Cedar River Watershed	4.80	5.00	4.75	4.80
Welcome	4.73	3.00	4.50	5.00
Grant Workshop	4.73	5.00	4.25	4.90
Introduction to Water Testing	4.73	5.00	4.75	4.70
Reservation Story, Groundwater Contamination	4.73	5.00	4.75	4.70
Seven Intelligence's	4.60	5.00	4.25	4.70
Foul Water Lab	4.60	5.00	4.50	4.60
Student Science Fair	4.57	4.00	5.00	4.44
Jigsaw Activities about Watersheds	4.53	3.00	4.25	4.80
Puget Sound Model	4.53	4.00	4.25	4.70
Excel Exercise	4.53	4.00	4.75	4.50
Demo Night	4.53	4.00	5.00	4.40
E-mail Introduction	4.50	2.00	5.00	4.56
Household Chemical Lab	4.50	5.00	4.50	4.43
Density Labs	4.47	5.00	4.50	4.40
Mt. Rainier Trip	4.43	3.00	4.50	4.56
Mt. Rainier Trip - Paradise Walk	4.43	3.00	5.00	4.33
Cultural Significance of Environmental Stewardship	4.40	3.00	4.00	4.70
Acid/Base Lab	4.40	4.00	4.50	4.40
Properties of Water	4.40	5.00	4.50	4.30
Hot Dog Lab	4.38	5.00	4.75	4.13
Archeology Talk	4.36	4.00	4.00	4.50
Mt. Rainier Trip - Grove of the Patriarchs	4.36	3.00	5.00	4.22
Solvent / Chromatography	4.33	4.00	4.25	4.40
Science in Science Fiction Films	4.31	4.00	4.75	4.13
Movie - The Periodic Table	4.29	3.00	4.00	4.56
Discovery Park	4.27	5.00	4.75	4.00
Chloride Titration of Estuary Water	4.23	5.00	4.50	4.00
Tour of Metro Plant	4.20	5.00	3.25	4.50
Archeology of West Point Video	4.20	4.00	3.75	4.40
Navajo Weaving & Poetry	4.15	3.00	4.75	4.00
How Chemists Measure	4.15	5.00	4.75	3.75
Metro Lab Tour	4.14	5.00	4.00	4.11
Groundwater Model	4.13	4.00	3.25	4.50
Indian Barbie Doll	4.07	3.00	4.00	4.22
Acid/Base Lecture	4.07	3.00	4.00	4.20
Light & Spectroscopy	4.07	5.00	4.25	3.90
Making Spectrum Boxes	4.07	5.00	4.25	3.90
Check In & Band Activities	4.00	5.00	4.00	3.90
Preparing for College	3.90	3.00	4.25	3.80
Mt. Rainier Trip - Ranger Talk	3.79	3.00	4.25	3.67
Tour of Campus Puzzle	3.79	3.00	4.50	3.56
Ions, Polarity, Solubility	3.73	2.00	3.50	4.00
Baseball Game	3.73	2.00	5.00	3.40
Food Web Activity	3.54	5.00	3.50	3.38
Introduction to UW Library System	3.40	2.00	4.00	3.30

BEST COPY AVAILABLE

Two culminating events of the 1996 Institute were the teachers presentations and the student science fair. Participants were afforded the opportunity to comment on these activities on the event questionnaire. In regard to the teacher presentations, almost all the comments were positive using words like "good" and "fantastic." Most felt it was beneficial because it allowed the teachers to get new ideas about teaching, new lesson plans, and different styles of presentation. There were suggestions for improvement. One teacher thought that "the presentations should be required to have a strong Native American integration of science and culture." Another commented that, "it would be better if we got immediate feedback - ESPECIALLY from the students." A student wrote "it was really good that we, as students, got to grade them." S/he went on, "I think that sometimes teachers forget that if they don't present with enthusiasm, or a way that kids like, then the kids won't learn and it will have been a waste of time."

Reaction to the student science fair was positive also, if somewhat more subdued. The student projects were variously described as "great," "interesting," and "enjoyable." Several commentators remarked that although many of the projects were well done, it was evident that some were just thrown together or as one put it "too much procrastination." Suggestions included that "students should be strongly advised to include a culturally significant aspect to their projects" and that they be given supplies earlier. A student also commented that s/he should have been told that UW staff was judging them.

Participants were also asked to comment on NASON staff who either made special contributions or inhibited their learning or experience. Most comments were positive and seemed to compliment everyone on the staff. A couple of people commented that the lecture approach of some sessions of the Institute was at odds with the teaching about seven intelligences. One respondent mentioned that the TAs sometimes had a hard time remembering their roles and were being playful with the students when the students should have been learning. S/He also mentioned, "the obvious tension between the two coordinators was distracting and disturbing." Finally, a student complained about an RA but offered no specifics.

Open Ended Questions

Participants were asked a series of open-ended questions in both the pre- and post-Institute surveys. Although some of the questions were common to all three types of surveys (student, teacher, and paraprofessional), most were not. Generally, teachers and paraprofessionals were asked similar, if not identical, questions regarding the integration of science with Native American culture, how Native American students were welcomed into the class, effective teaching methods, and problems encountered with Native American students. Teachers alone were asked about their goals for teaching science. Students were asked what made them feel welcome in a class, what they thought were the best and worst things about studying science, and what their career goals were. In the concluding survey, all participants were asked what they had learned from each of the groups (students, teachers, and paraprofessionals) and what were the best and worst aspects of the Institute. A

complete listing of participant comments is included in Appendix IV but some highlights follow:

Making Native American Students Feel Welcome in the Classroom

Teachers and paraprofessionals were asked both at the beginning and end of the Institute what they would do to make Native American students feel welcome in their classrooms. Students were asked at the start of the Institute what made them feel welcome. Teacher and paraprofessional responses changed very little over the course of the Institute. They hoped to build a community in their classrooms by having students share ideas in a non-threatening environment. Teachers expected to get to know students as individuals, encourage them as scholars, make contact with their families, and show them respect. After the Institute, several teachers indicated that they would focus more on including Native American culture and history in their instruction. Students felt welcomed when the teachers expressed an interest in them (but "not too much interest"), when the teachers made learning fun, and when they worked cooperatively with other students on classroom projects.

Teachers Overall Goals for Students

Teacher goals for students did not change markedly over the course of the Institute. Initially, several teachers wrote that they hoped that students would experience the presence of science in their everyday lives. Others hoped to make their students independent, life-long learners. They also hoped to instill in students confidence and a belief in their own abilities. Other goals mentioned included having students feel comfortable with science, able to work together cooperatively, and a mastery of basic science concepts. One teacher identified specific elements for students to learn including metrics and cell biology. After the Institute, these general ideas were still present but focused more on having students apply basic scientific principles to their everyday lives, be independent learners, and have fun exploring science on their own.

Integration of Science and Native American Culture

When questioned if and how they integrated Native American culture into their science teaching, most teachers indicated that they had made an attempt. At the beginning of the Institute, most respondents wove ecological themes into their curriculum, frequently river quality. One used a "Medicine Wheel" to discuss ecological balance. Through the Institute, these generalized themes seem to have become more focused. Teachers' responses at the end of the session reflected more specific ideas such as using the life-cycle of the salmon or the study of the Chehalis River. These topics would be introduced with legends perhaps told by Native American storytellers.

Effective Ways to Teach Native American Students

Open ended questions in the opening and closing questionnaire asked teachers to report the most effective thing that they did when teaching science to Native American students. In many ways their responses echoed how they integrated science and Native American culture. At the opening of the Institute, they wrote about cooperative, group learning projects; hands-on experiments; field trips; relating instruction to the local environment; and positive motivation of their students. At the conclusion of the Institute, they recorded these

things but mentioned some changes in their behavior, as well. Some considered tailoring their lesson plans to recognize students' differing learning styles. Others considered spending more time listening to students and being open to their problems. Many felt the Institute had provided them with more cultural examples that would be useful.

Biggest Problems Encountered in Working With Native American Students
Teachers were asked what they experienced as the biggest problems working with Native American students. Items listed by teachers included students' lack of self-confidence, poor attendance patterns, lack of time available for them to complete school work, and unresponsiveness or lack of motivation.

Student Views, the Best and Worst Things about Studying Science
Students were asked at the beginning and end of the Institute what were the best and worst things about studying science. Interestingly, many of the best things were what teachers viewed as their goals or as effective techniques. Students wanted information they could use in their lives, and wanted to learn about their world. They enjoyed labs, field trips, and hands-on projects. At the end, the few students who responded focused on the labs, applying what they learned, and "learn(ing) about lots of stuff you'll use later, and gain(ing) interesting knowledge."

Their views of what was the worst thing about studying science did alter slightly during the Institute. Initially, students picked very specific items, e.g. taking notes, dissections, memorization of names, etc. At the end of the Institute, students still identified memorization, papers, and homework, but at least one student indicated the intimidation of the breadth of science when she wrote, "There is just so much."

Most Important Things Learned from the NASON Institute
All participants were asked to recollect what was the most important thing that they had learned from the Institute. Teachers' comments were in four specific areas: teaching methods (hands-on activities, experiments, and resources), Native American culture, basic scientific principles, and how to motivate Native American students. The few students who responded focused on learning some basic science (especially water quality), lab experiences, and working with other people.

Best Part of the NASON Institute
Closely coupled with the most important things learned was a question about what the participants found to be best for them personally and professionally (in the case of teachers). Some teachers had a difficult time narrowing their responses to only one item. One teacher mentioned "basic information about science" which included labs, lectures, and talking with the Chemistry instructor. Two teachers wrote that the connections established with other people was the best part. One reported that getting to do the teacher presentation was the best. Some students, too, found that meeting new people was the best for them. Another liked the science fair. Another liked "basically everything."

Worst Part of the NASON Institute
Participants also got to express what they considered to be the worst part of the Institute.

Some of the teachers found the academic rigors too much for them. One lamented about being away from home for too long. Other teachers complained about the negativity and disrespect shown by some of the participants. Two felt that more time could have been devoted to exploring issues related to teaching Native American students. Students had less substantial complaints. One did not like riding in the back of the van. Another found the early mornings too taxing, and a third was disappointed in herself for not working on her science project soon enough.

CONCLUSION

At the end of three years of Summer Institutes, NASON is largely successful in meeting a complex, although parallel, set of goals relating to educators and to students. In striving to meet the professional goals of teachers and paraprofessionals, NASON must also take into consideration the academic and developmental needs of high school students. Bringing these three groups together in a single program is undertaking a feat of coordination and balance. In the results monitored by this office, there have been successes in both major areas, for educators and for students. However, the emphasis of the 1996 Institute as compared to 1995 has shifted somewhat by emphasizing the academic components slightly more than in the previous year. In 1996, teachers indicated a stronger sense of accomplishment and appreciation of basic science than previously. Students, too, evidenced stronger agreement with the understanding of scientific principles conveyed by the Institute. These ratings were corroborated by what was written by teachers in their closing questionnaire. They valued the Institute's contribution to teaching methods, basic science understanding, and experience with labs. Students echoed these views. Also mentioned by teachers was the Institute's exploration of Native American culture and motivational skills for their students.

Although it was obvious that some connection was made between cognitive instruction in basic science and Native American culture, comments by teachers indicate they would welcome even more direct contact with cultural resources. Lower ratings on how teachers felt they were taught about techniques for teaching Native American students and better ways to communicate with students' parents indicate a slight change in Institute priorities from 1995 to 1996. Interestingly, this shift in priority did not prevent the rating by Native American students who attended in 1996 from being much more positive than in 1995.

Other factors which influence the outcome of the Institute may be the number of participants, their ages, and returnees. The 1996 Institute had fewer participants which may have presented the opportunity for closer contact with NASON staff. Thus, more individualized attention to participants could be a factor in higher ratings. The students, besides being fewer in number, were also younger on average. Although they may not have had as much prior schooling, they may be more impressionable. Further, one teacher wrote in response to an open-ended question about having attended NASON previously. There are no questions on the surveys which ask participants if this is their first experience with NASON. This information would be an important bit of data for reviewers to have.

Finally, the ultimate test of the impact of the NASON Summer Science Institute would be the persistence of its lessons on the personal and professional lives of those who attended. As a matter of course, the Institute should undertake to survey those teachers and paraprofessionals who have attended over the past three years. They should be asked to identify areas where information gleaned from the Institute has been useful in improving their teaching effectiveness. In addition, they should be queried as to what specific areas not covered by NASON would have proven useful. These questions should be directed to three distinct areas, basic science skills, teaching techniques, and interpersonal relations with students and their parents or guardians.

Student impact, too, could be a focus of NASON inquiry. Working with schools and tribes, it would be worthwhile to track students who have participated in NASON. The students themselves would be the best source of this information. Perhaps an annual questionnaire to these students for up to four years following the Institute would provide useful input. How many have persisted in their education? Have they continued to take and have academic success in science courses? Have their future academic and career plans been impacted by their involvement in NASON?

NASON seeks to have a long term impact on science education. From the evidence gathered in the last two of the three years of the Summer Institute, it appears that for educators (teachers and paraprofessionals) it has provided sound basics for science instruction at the high school and middle school level. So, too, has it provided some tools for reaching and motivating Native American students through examples of experiments and hands-on activities that connect with student lives. Native American students who have attended have been challenged by science instruction and encouraged to be confident in their abilities. These results have been demonstrated by these groups in concluding questionnaires. The persistence of these positive outcomes should be the subject of further study.

APPENDICES

Native American Science Outreach Network (NASON) Summer Institute - 1996
STUDENT QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this code because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later in the Institute.

Gender: [1] Male [2] Female

Age: _____

1. What are your educational plans? (Check one.)

[1] I won't finish high school.
[2] Finish high school but not continue education
[3] After high school, go to Vocational School
[4] After high school, go to Community College
[5] After high school, go to Four-Year College
[6] Other: _____
[7] I don't really know yet.

2. What is the highest degree you hope to attain? (Check one.)

[1] High School Diploma
[2] AA Degree (Community College)
[3] Bachelor's Degree (4-Year College)
[4] Master's Degree
[5] Ph. D. (Doctor of Philosophy)
[6] MD (Doctor of Medicine)
[7] Other: _____

3. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My parents would like me to study science.	SA	A	N	D	SD
Science is boring to me.	SA	A	N	D	SD
What I learn in science does not relate to my life.	SA	A	N	D	SD
Scientific research can be done equally well by Native Americans and non-Natives.	SA	A	N	D	SD
My tribe has no use for science or technology.	SA	A	N	D	SD
No matter how hard I work, I lack the natural ability to do well in science.	SA	A	N	D	SD
Science helps me understand the world around me.	SA	A	N	D	SD
I think Native Americans are not as capable as other people in science.	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
I would be content just taking the minimum science requirements for high school.	SA	A	N	D	SD
I believe that studying science is important for me personally.	SA	A	N	D	SD
My family does not want me to go to college.	SA	A	N	D	SD
Science helps me understand myself.	SA	A	N	D	SD
I believe that science will help members of my family and my tribe to have a better life.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
I am interested in a career in science or engineering.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
If I work hard, I can do well in science.	SA	A	N	D	SD

BEST COPY AVAILABLE

I am interested in science.	SA	A	N	D	SD

4. In school you work on many types of assignments. For each description below, check the box that shows how you would best like to work on the assignment:

Type of Assignment	Alone	With a group	With a couple of close friends	With family members
General homework	1☐	2☐	3☐	4☐
Studying for a test	1☐	2☐	3☐	4☐
Writing a paper	1☐	2☐	3☐	4☐
Working on a science project	1☐	2☐	3☐	4☐
Reading a book or paper	1☐	2☐	3☐	4☐
Doing library research	1☐	2☐	3☐	4☐

5. Do you plan to take any science classes in high school? 1☐ Yes 2☐ No

If your answer is "yes", circle as many of the classes below as you intend to take.

1 Agricultural Science
2 Biology
3 Chemistry
4 Earth Science
5 Environmental Science
6 Physics
7 Other: _____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. I feel welcome in a classroom when _____

7. The best things about studying science are _____

8. The worst things about studying science are _____

BEST COPY AVAILABLE

9. If I could have any job I wanted, I would be _____

10. Things I would like to learn but am never taught are _____

11. Skills and knowledge I would like to share with others at the Institute include _____

12. Things I would really like to learn from the NASON Institute are _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1996
TEACHER QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this code because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later during the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

Please indicate your racial/ethnic identification. (Check all that apply.)

[1] ☐ African American
[2] ☐ Alaskan Native
[3] ☐ Native American
[4] ☐ Asian or Pacific Islander
[5] ☐ Hispanic/Latino
[6] ☐ Caucasian (Not of Hispanic Origin)

1. For each of the following items, please circle the response that best represents how often the following statements describe your science class.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy teaching science.	MT	F	S	AN
I have students apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
I have students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	MT	F	S	AN
I ask students hypothetical "What if . . . ?" questions	MT	F	S	AN
I wait at least 3 seconds before calling on a student.	MT	F	S	AN
I have students brainstorm ideas.	MT	F	S	AN
I call on the first student who raises his/her hand.	MT	F	S	AN
I relate what we are studying to tribal issues.	MT	F	S	AN
I relate what we are studying to careers.	MT	F	S	AN
I ask students to explain how they arrived at an answer.	MT	F	S	AN
Students are exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members help or teach in the classroom.	MT	F	S	AN

2. For how many years have you been teaching science in middle or high school? _____ years.

BEST COPY AVAILABLE

3.. **For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.**

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	SA	A	N	D	SD

4. Considering the list below, divide your typical teaching day by the type of activity. Your total should equal 100%.

Lecture _____%
Teacher demonstration _____%
Class discussion _____%
Small group work _____%
Student presentation _____%
Experiment / Hands-On Activity _____%
Other: _____ _____%

5. Do you integrate science with Native American culture in your classroom? [1] ❑ **Yes** [2] ❑ No
If yes, please give an example of how you combine your science teaching with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. To make Native American students feel welcome in the classroom, I _____

_____

_____

_____

_____

_____

7. In teaching science my overall goals for students are _____

_____

_____

_____

_____

_____

BEST COPY AVAILABLE

8. The most effective things I do when teaching science to Native American students are _____

9. The biggest problems I encounter when teaching science to Native American students are _____

10. Skills and knowledge I would like to share with others at the Institute include _____

11. Things I would really like to learn from the NASON institute include _____

Native American Science Outreach Network (NASON) Summer Institute - 1996
PARAPROFESSIONAL QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here to other surveys that will be given during the course of the Institute. We would like you to think of a simple 4 or 5 letter word or 4 or 5 numbers that will be your "secret" code. Write it in the box below. It is important to remember this word because you will be asked to write it on other questionnaires as well. Please write it down somewhere so you can refer to it later in the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items , please circle the response that best represents how often the following statements describe the classes where you have worked.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy assisting in teaching science.	MT	F	S	AN
Students in the classes I assist are asked to apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
These students are asked to brainstorm ideas.	MT	F	S	AN
In these classes the first student who raises his/her hand is called on.	MT	F	S	AN
What we are studying is related to tribal issues in the classes where I work.	MT	F	S	AN
What we are studying is related to careers.	MT	F	S	AN
Students are asked to explain how they arrived at an answer.	MT	F	S	AN
Students are exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members help or teach in the classroom.	MT	F	S	AN

2. For how many years have you been a paraprofessional? _____ years.

3. What is your present educational level? (Check one.)

[1] ☐ Some High School
[2] ☐ High School Diploma
[3] ☐ AA Degree (Community College)
[4] ☐ Bachelor's Degree
[5] ☐ Master's Degree
[6] ☐ Doctorate (Ph. D., M.D.)
[7] ☐ Other: _____

4. What is the highest degree you hope to attain? (Check one.)

[1] ☐ High School Diploma
[2] ☐ AA Degree (Community College)
[3] ☐ Bachelor's Degree (4-Year College)
[4] ☐ Master's Degree
[5] ☐ Ph. D. (Doctor of Philosophy)
[6] ☐ M.D. (Doctor of Medicine)
[7] ☐ Other: _____

BEST COPY AVAILABLE

5. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to help teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important to me to understand Native American history and culture in order to be a better helper for my students.	SA	A	N	D	SD
My tribe has no use for science or technology	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
I believe that studying science is important for Native American students.	SA	A	N	D	SD

6. In the classes where you work, is science integrated with Native American culture? [1] ❑ Yes [2] ❑ No

If yes, please give an example of how science teaching is combined with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

7. To make Native American students feel welcome in the classroom, I _____

_____

_____

_____

_____

_____

8. The most effective things I do when helping teach Native American students are _____

_____

_____

_____

_____

_____

BEST COPY AVAILABLE

9. The biggest problems I encounter when helping teach Native American students are _____

10. Things I think should be taught but are not taught in my school are _____

11. Skills and knowledge I would like to share with others at the Institute include _____

12. Things I would really like to learn from the NASON institute include _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1996
STUDENT QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. What are your educational plans? (Check one.)
   - [1] ☐ I won't finish high school.
   - [2] ☐ Finish high school but not continue education
   - [3] ☐ After high school, go to Vocational School
   - [4] ☐ After high school, go to Community College
   - [5] ☐ After high school, go to Four-Year College
   - [6] ☐ Other: _____
   - [7] ☐ I don't really know yet.

2. What is the highest degree you hope to attain? (Check one.)
   - [1] ☐ High School Diploma
   - [2] ☐ AA Degree (Community College)
   - [3] ☐ Bachelor's Degree (4-Year College)
   - [4] ☐ Master's Degree
   - [5] ☐ Ph. D. (Doctor of Philosophy)
   - [6] ☐ MD (Doctor of Medicine)
   - [7] ☐ Other: _____

3. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My parents would like me to study science.	SA	A	N	D	SD
Science is boring to me.	SA	A	N	D	SD
What I learn in science does not relate to my life.	SA	A	N	D	SD
Scientific research can be done equally well by Native Americans and non-Natives.	SA	A	N	D	SD
My tribe has no use for science or technology.	SA	A	N	D	SD
No matter how hard I work, I lack the natural ability to do well in science.	SA	A	N	D	SD
Science helps me understand the world around me.	SA	A	N	D	SD
I think Native Americans are not as capable as other people in science.	SA	A	N	D	SD
Native Americans have made important scientific discoveries.	SA	A	N	D	SD
I would be content just taking the minimum science requirements for high school.	SA	A	N	D	SD
I believe that studying science is important for me personally.	SA	A	N	D	SD
My family does not want me to go to college.	SA	A	N	D	SD
Science helps me understand myself.	SA	A	N	D	SD
I believe that science will help members of my family and my tribe to have a better life.	SA	A	N	D	SD
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D	SD
I am interested in a career in science or engineering.	SA	A	N	D	SD
Science is at odds with my cultural beliefs.	SA	A	N	D	SD
If I work hard, I can do well in science.	SA	A	N	D	SD
I am interested in science.	SA	A	N	D	SD

136 BEST COPY AVAILABLE

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly

Statement	Strongly Agree	Agree	Neutral	Disagree
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D
Through this Institute, I have gained a greater appreciation of my Native American heritage.	SA	A	N	D
Through this Institute, I have learned new computer skills.	SA	A	N	D
Through this Institute, I have learned principles of chemistry.	SA	A	N	D
Because of the Institute, I am eager to continue my schooling.	SA	A	N	D
I felt comfortable working in groups with the teachers and paraprofessionals.	SA	A	N	D
The Institute did **not** increase my appreciation of science.	SA	A	N	D
During the Institute, I learned many laboratory skills.	SA	A	N	D
I now feel better prepared to be successful in science.	SA	A	N	D
During the Institute, I have learned valuable study skills.	SA	A	N	D
Because of the Institute, I have a better understanding of how science can be used in everyday life.	SA	A	N	D
Through the Institute, I understand the scientific basis of the way things work in the environment.	SA	A	N	D

4. In school you work on many types of assignments. For each description below, check the box that shows how best like to work on the assignment:

Type of Assignment	Alone	With a group	With a couple of close friends	Wit me
General homework	[1]☐	[2]☐	[3]☐	
Studying for a test	[1]☐	[2]☐	[3]☐	
Writing a paper	[1]☐	[2]☐	[3]☐	
Working on a science project	[1]☐	[2]☐	[3]☐	
Reading a book or paper	[1]☐	[2]☐	[3]☐	
Doing library research	[1]☐	[2]☐	[3]☐	

5. Do you plan to take any science classes in high school? [1]☐ **Yes** [2]☐ **No**

If your answer is "yes", circle as many of the classes below as you intend to take.

[1]Agricultural Science [2]Biology
[3]Chemistry [4]Earth Science
[5]Environmental Science [6]Physics
[7]Other: _____

For the following series of questions, complete the statements by writing your thoughts and ideas.

6. The best things about studying science are _____

_____

_____

_____

7. The worst things about studying science are _____

_____

_____

_____

BEST COPY AVAILABLE

8. If I could have any job I wanted, I would be _____

9. Things I would like to learn but am never taught are _____

10. The most important things I learned from the NASON Institute are _____

11. During the Institute, you have had the opportunity to interact with several different groups of people. What are the most important things you have learned from . . .

a) Teachers - _____

b) Paraprofessionals - _____

c) Other students - _____

12. The best part of the Institute for me was _____

12. The worst part of the Institute for me was _____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1996
TEACHER QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other su that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that yo at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items, please circle the response that best represents how often the following statements likely to describe science classes you teach in the future.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almo
I enjoy teaching science.	MT	F	S	
I will have students apply what they are learning to real life situations and to their personal experiences.	MT	F	S	
I will have students make drawings, schematics, webs, or concept maps to demonstrate their understanding of scientific concepts.	MT	F	S	
I will ask students hypothetical "What if . . . ?" questions	MT	F	S	
I will wait at least 3 seconds before calling on a student.	MT	F	S	
I will have students brainstorm ideas.	MT	F	S	
I will call on the first student who raises his/her hand.	MT	F	S	
I will relate what we are studying to tribal issues.	MT	F	S	
I will relate what we are studying to careers.	MT	F	S	
I will ask students to explain how they arrived at an answer.	MT	F	S	
Students will be exposed to Native American as well as non-Native role models in science.	MT	F	S	
Parents or community members will help or teach in the classroom.	MT	F	S	

BEST COPY AVAILABLE

BEST COPY AVAILABLE

2. For each of the items below, please circle the response that best represents your level of agreement or disagreement with the statement.

SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel confident in my ability to teach science to Native American students.	SA	A	N	D	SD
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D	SD
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D	SD
It is important for me to understand Native American history and culture in order to be a better teacher for my students.	SA	A	N	D	SD
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D	SD
Through this Institute, I have gained a greater appreciation for Native American history and culture.	SA	A	N	D	SD
Through this Institute, I have learned new computer skills.	SA	A	N	D	SD
Through this Institute, I have learned principles of chemistry.	SA	A	N	D	SD
I felt comfortable working in groups with the paraprofessionals and students.	SA	A	N	D	SD
The Institute has taught me techniques for teaching Native American students effectively.	SA	A	N	D	SD
Through the Institute, I have learned better ways to communicate with the parents of my students.	SA	A	N	D	SD
The Institute has taught me ways to connect the science I teach to the everyday lives of my students.	SA	A	N	D	SD

3. Considering the list below, divide what you envision as a typical teaching day next year by the type of activity. Your total should equal 100%.

Lecture _____%
Teacher demonstration _____%
Class discussion _____%
Small group work _____%
Student presentation _____%
Experiment / Hands-On Activity _____%
Other: _____ _____%

4. Do you think it is important to integrate science with Native American culture in your classroom? [1]❑ Yes [2]❑ No
If yes, please give an example of how you might combine your science teaching with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

5. To make Native American students feel welcome in the classroom next year, I will _____

_____

_____

BEST COPY AVAILABLE

6. In teaching science my overall goals for students are _____

_____

_____

_____

7. The most effective things I could do when teaching science to Native American students are _____

_____

_____

_____

8. During the Institute, you have had the opportunity to interact with several different groups of people. What are th important things you have learned from . . .

a) Students - _____

_____

_____

b) Paraprofessionals - _____

_____

_____

c) Other teachers - _____

_____

_____

9. The best part of the Institute for me personally and professionally was _____

_____

_____

_____

10. The worst part of the Institute for me was _____

_____

_____

_____

BEST COPY AVAILABLE

Native American Science Outreach Network (NASON) Summer Institute - 1995
PARAPROFESSIONAL QUESTIONNAIRE

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

Gender: [1] ☐ Male [2] ☐ Female Age: _____

1. For each of the following items , please circle the response that best represents how often you think the following statements ought to describe the classes where you work in the future.

MT = Most of the Time F = Frequently S = Sometimes AN = Almost Never

Statement	Most of the Time	Frequently	Sometimes	Almost Never
I enjoy assisting in teaching science.	MT	F	S	AN
Students in the classes I assist should be asked to apply what they are learning to real life situations and to their personal experiences.	MT	F	S	AN
These students should be asked to brainstorm ideas.	MT	F	S	AN
In these classes the first student who raises his/her hand should be called on.	MT	F	S	AN
What we are studying should be related to tribal issues in the classes where I work.	MT	F	S	AN
What we are studying should be related to careers.	MT	F	S	AN
Students should be asked to explain how they arrived at an answer.	MT	F	S	AN
Students should be exposed to Native American as well as non-Native role models in science.	MT	F	S	AN
Parents or community members should help or teach in the classroom.	MT	F	S	AN

2. What is the highest degree you hope to attain? (Check one.)

[1] ☐ High School Diploma
[2] ☐ AA Degree (Community College)
[3] ☐ Bachelor's Degree (4-Year College)
[4] ☐ Master's Degree
[5] ☐ Ph. D. (Doctor of Philosophy)
[6] ☐ M.D. (Doctor of Medicine)
[7] ☐ Other: _____

BEST COPY AVAILABLE

3. For each of the items below, please circle the response that best represents your level of agreement or disagreem the statement.

SA = Strongly Agree **A** = Agree **N** = Neutral **D** = Disagree **SD** = Strongly D

Statement	Strongly Agree	Agree	Neutral	Disagree
I feel confident in my ability to help teach science to Native American students.	SA	A	N	D
I think that the family plays a critical role in helping a student achieve academically.	SA	A	N	D
It is important for me to develop relationships with the families of Native American students.	SA	A	N	D
It is important to me to understand Native American history and culture in order to be a better helper for my students.	SA	A	N	D
My tribe has no use for science or technology	SA	A	N	D
Native Americans have made important scientific discoveries.	SA	A	N	D
All Americans -- regardless of ethnicity -- have the same need to study science in high school.	SA	A	N	D
Science is at odds with my cultural beliefs.	SA	A	N	D
I believe that studying science is important for Native American students.	SA	A	N	D
Through this Institute, I have gained a greater understanding of scientific principles.	SA	A	N	D
Through this Institute, I have gained a greater appreciation for Native American history and culture.	SA	A	N	D
Through this Institute, I have learned new computer skills.	SA	A	N	D
Through this Institute, I have learned principles of chemistry.	SA	A	N	D
I felt comfortable working in groups with the paraprofessionals and students.	SA	A	N	D
The Institute has taught me techniques for teaching Native American students effectively.	SA	A	N	D
Through the Institute, I have learned better ways to communicate with the parents of my students.	SA	A	N	D
The Institute has taught me ways to connect the science I teach to the everyday lives of my students.	SA	A	N	D

4. Please give an example of how science teaching might be combined with Native American culture.

_____

_____

_____

_____

_____

For the following series of questions, complete the statements by writing your thoughts and ideas.

5. To make Native American students feel welcome in the classroom, I will _____

_____

_____

_____

BEST COPY AVAILABLE

6. The most effective things I could do when helping teach Native American students will be _____

_____

_____

_____

7. During the Institute, you have had the opportunity to interact with several different groups of people. What are the most important things you have learned from . . .

a) Teachers - _____

_____

_____

b) Students - _____

_____

_____

c) Other paraprofessionals - _____

_____

_____

8. The best part of the Institute for me personally and professionally was _____

_____

_____

_____

9. The worst part of the Institute for me was _____

_____

_____

_____

BEST COPY AVAILABLE

Appendix III. Event Questionnaire

Native American Science Outreach Network (NASON) Summer Institute - 1995

This questionnaire will be totally anonymous but we would like to be able to connect your answers here with other surveys that you have taken during the Institute. Please write your "secret code" in the box below. This is the "code" that you chose at the beginning of the Institute.

I. We are interested in your opinions about how useful the events of the Institute were to you. Please circle the number that best represents your reaction to the listed event. The range is from one (1) to five (5) with 1 being "not at all useful" and 5 being "extremely useful".

NASON Event Evaluation

Week		Event/Activity	1=Not at all useful	2=Not very useful	3=Neutral	4=Some-what useful	5=Very useful
Week 1	a)	Check in and campus tours	1	2	3	4	5
	b)	Welcome - Harold Belmont/John Simpson	1	2	3	4	5
	c)	Tour of Campus Puzzle	1	2	3	4	5
	d)	Cultural Significance of Environmental Stewardship - Charlene Poste	1	2	3	4	5
	e)	Archeology of West Point					
		Video	1	2	3	4	5
		Puget Sound Model (Oceanography)	1	2	3	4	5
		Archeology Talk - Leonard Forsman / Bob Peterson	1	2	3	4	5
	f)	Tour of Metro Plant	1	2	3	4	5
	g)	Discovery Park	1	2	3	4	5
	h)	Properties of Water - Sara	1	2	3	4	5
	i)	Grant Workshop - Nan	1	2	3	4	5
	j)	Density Labs	1	2	3	4	5
	k)	Demo night	1	2	3	4	5
	l)	E-mail Introduction - Briana	1	2	3	4	5
	m)	Movie - The Periodic Table	1	2	3	4	5
	n)	Indian Barbie Doll - Anneliese Truame	1	2	3	4	5
Week 2	a)	Ions, Polarity, Solubility - John	1	2	3	4	5
	b)	Solvent/Chromatography Lab	1	2	3	4	5
	c)	Acid/Base Lecture - John	1	2	3	4	5
	d)	Acid/Base Lab (Red Cabbage, Vinegar)	1	2	3	4	5
	e)	Seven Intelligences - Richard Powell	1	2	3	4	5
	f)	Jigsaw Activities about Watersheds (Road Building, Pollution, Stream Contours, etc.)	1	2	3	4	5
	g)	Introduction to Water Testing Kits	1	2	3	4	5
	h)	Water Dept. Talks - Trip to Cedar River Watershed	1	2	3	4	5
	i)	Light and Spectroscopy - Sara	1	2	3	4	5
	j)	Making Spectrum Boxes	1	2	3	4	5
	k)	Introduction to UW Library System	1	2	3	4	5
Week 3	a)	Groundwater Model - David Fuller and Sherry Crowell	1	2	3	4	5
	b)	EXCEL Exercise - Briana	1	2	3	4	5
	c)	Baseball game	1	2	3	4	5
	d)	Reservation Story Groundwater Contamination - Sara	1	2	3	4	5
(Over)	e)	Foul Water Lab	1	2	3	4	5

BEST COPY AVAILABLE

Week 3 *(cont'd.)*	f)	Food Web Activity	1	2	3	4
	g)	Mt. Rainier Trip	1	2	3	4
		Ranger Talk	1	2	3	4
		Paradise Walk	1	2	3	4
		Grove of the Patriarchs	1	2	3	4
	h)	Navajo Weaving and Poetry - Wesley Thomas	1	2	3	4
	i)	Preparing for College - Scott Pinkham & Julian Argel	1	2	3	4
	j)	Science in Science Fiction Films - Sara	1	2	3	4
Week 4	a)	How Chemist's Measure (Hobie or Moles) - Sara	1	2	3	4
	b)	Chloride Titration of Estuary Water	1	2	3	4
	c)	Hot Dog Lab	1	2	3	4
	d)	Household Chemical Lab	1	2	3	4
	e)	Metro Lab Tour	1	2	3	4
	f)	Student Science Fair	1	2	3	4

II. Please comment on the Teacher's Presentation - Teachers comment on the activity as a learning experience both fr presentation side and the participant side. Students give your viewpoint of the activity as a learning experience.

III. What other activities or events would you like to see included in the Institute.

IV. Please comment on the Science Fair.

V. Were there any members of the NASON staff who made special contributions to your experience at the Institute? who were they and what did they do?

VI. Were there any members of the NASON staff who inhibited your learning or experience at the Institute? If so, w they do or not do? (Names are not necessary.)

VII. Additional Comments?

BEST COPY AVAILABLE

Pre- & Post-Institute Survey Responses

Students, Pre-Institute Survey

I feel welcome in a classroom when:

The other people don't ignore me, but they don't give me a lot of attention.

The teacher shows their interest in you and really like what they're teaching making it fun to learn.

Don't understand the question

We all participate equally in a group activity and work together.

The teacher is friendly and open to new ideas, and the students are co-operative and share roughly the same interests.

People are nice to each other, and are willing to help/volunteer.

The teacher is very willing to help you and answer any questions you have. When I know what will be learned ahead of time, and when there are people in the class who I know will be willing to help me study if I need it.

Teachers, Pre-Institute Survey

To make Native American students feel welcome in the classroom, I:

Talk about the importance of community , cultural identity, share my history, tell them how smart they are, successful will be, talk about futures in college.

Try to take a personal interest in their families as well as special tribal events that they take part in.

Treat them with respect. Try to be aware of cultural differences. Discuss Native American issues - ask them for their point of view - but this is the way all students are treated in my classroom.

Welcome all my students. We all share about ourselves, our own experiences, and our families. We often discuss Native issues - because it is a large part of the curriculum. I do not single out any student, if one feels like sharing, they do. Mine is a non-threatening environment.

Would acknowledge how important to have students from different backgrounds and experiences. The class would brainstorm "Why it's important to know the Native American culture."

Let them know of brothers & sisters who I have taught in the past. Tell them about my teaching of the Native American Resource Room and Summer School at the Muckleshoot Youth work study program.

Get to know them as a student in the classroom and their involvement in the school. My school is on the 4-period day (90 min. a class) which allows the teachers to really get to know the students. I treat all students the same and give them all respect because they are important people in my classroom.

Use my own experiences/ knowledge of traditions. Have my students feel a part of the curriculum.

Talk with them about their interests and family life (whatever they are willing to share). Relate my teaching to their life (culture).

Put all students at table groups of "Families" or family teams. They solve problems within their group. I welcome students individually each day, quietly as they enter the class. I have "teams" put on presentations to solve problems rather than individual presentations.

Paraprofessional, Pre-Institute Survey

To make Native American students feel welcome in the classroom, I:

Introduce myself and began the class with some type of joke.

BEST COPY AVAILABLE

Teachers, Post-Institute Survey

To make Native American students feel welcome in the classroom, I:

Try to find out more about their background, their tribe, and their culture.

Try to get to know them on a more personal level - show them I care - but I already do this with all my students.

Respect them as individuals.

Tell my students that everyone can excel in my class if they try and put forth effort and that I will do all I can if they are willing to try as well.

Incorporate more culturally significant materials, take even more time to get to know my students and about their family lives.

Be more aware of their culture and get to know it more. I think it is very important to get to know my students outside of the classroom because it helps to better the relationships in the classroom and improve learning.

Greet all my students at the door. Have things around the room to make all my students feel more welcome.

Gain knowledge about their interests. Call parents with positive feedback (early in school year). Integrate Native American history into our science projects.

Make a greater effort to learn a few words in their language and welcome each student every day.

Teachers, Pre-Institute Survey

In teaching science my overall goals for students are:

To be comfortable with science as a simple, fun, everyday occurrence. That many things they do are related to science.

To relate the information presented to their lives. Also, students need to work cooperatively in science to demonstrate their knowledge of the content.

To be more aware of science, the universe, substance abuse issues, and coastal waters - tide pool communities and effects the earth's moon's and sun's gravitational pull affects our planet and the life on it.

To have fun, make do and get messy. Believe that they can do anything.

Having students "do science" for themselves. Also, students are responsible of their own learning.

Complete homework, learn something about metrics, cell biology & ecosystems and to have fun.

To gain knowledge and feel confident in what they know. Since I teach chemistry & physics which is college prep I stress critical thinking and problem solving. I realize each student in my room does not love science but I can help them appreciate it and learn to like it. I also believe students will take more from my classroom if I stress quality not quantity. I think they will succeed better in college if they take some basics from my classroom.

To have an excitement for learning. For facilitating the students, so they will go home excited to learn new things.

Students to understand basic concepts and be able to explain them in their own words. Students enjoy learning about science and its basics - they ask questions and are willing to put out effort to gain knowledge.

Making a hands on project oriented science curriculum that lets students experience science in real life. Problem solving situations. I try to link studying clean water for example with real life careers. Science is a doing activity and we do it.

BEST COPY AVAILABLE

Teachers, Post-Institute Survey

In teaching science my overall goals for students are:

To understand and apply the concepts to their lives.

To have a better understanding that science is all around them everyday whether they realize it or not.

To have fun and experience learning.

For students to be self-learning and thinkers and responsible. Appreciate the value of science methods.

To get involved physically and to have fun.

To have a good positive and fun experience in the learning of science and to go away with some basic science principles that they can apply and use in their everyday lives and to be successful if they choose the college track.

To have fun and plant seeds so they will explore science on their own.

Teach basic concepts. Help them understand ecological problems/concerns. Help them become active in changing "problem" (pollution) areas.

To include more lab work and lab books. They make great "journals."

Teachers, Pre-Institute Survey

Give an example of how you combine your science teaching with Native American culture.

Don't teach science, but work science into class as an everyday occurrence, "science is everywhere."

Water quality unit w/ tribal fisheries/hatcheries.

We always come together as a circle. I use the medicine wheel as a starting point for understanding community balance, and environmental perspectives. Through studying Washington state, there are connections made.

I will use Native American traditions/culture in the classroom.

Use of rivers (local) in relationship to people, animals, & plant life.

We work with endangered animals & discuss reverence for all life forms and Native American culture and in paying respect to animal and plant life. We do a big recycling project to learn about reusing items and respecting the environment.

Paraprofessional, Pre-Institute Survey

Give an example of how you combine your science teaching with Native American culture.

Water control - We took the students to rivers around the school and showed how the water was contaminated and why they should keep little ones away.

Teachers, Post-Institute Survey

Give an example of how you combine your science teaching with Native American culture.

History

The salmon unit I teach could be integrated with Native history & culture surrounding the salmon.

Where I can, I'd like to introduce certain sections with legends. Introduce the Medicine Wheel - circle of life and relate it to our lives.

I do this all the time. I teach about Washington natives.

Show how these issues are important especially to Native American cultures (water, salmon).

Using the resource guides, I will be able to increase the amount of cultural information into my lessons. I wish that the chemistry we did would have been more closely tied to Native American culture and given more significance and stress.

Just by making students aware of the Native American culture by exposing all students to it.

Using storytelling. Keepers of the Earth text. Bring in Native speakers.

Using our Chehalis River as a site for field trips and discussion. I will incorporate the tribe's needs and uses of the river.

I liked the teacher labs we did! I will use them all in helping to teach Native American culture and science.

Teachers, Pre-Institute Survey

The most effective things I do when teaching science to Native American students are:

Don't teach science.

Letting students work cooperatively with their peers, using technology tools to enhance the teaching/learning process, and using community members with expertise to speak/teach.

To give opportunities for group work and hands on activities.

N/A (not experienced)

Avoiding pressure on them when their home situation interferes with their success in my classroom.

Be positive and motivating and make them feel comfortable and safe in the learning environment.

Relate concepts to their native environment. Take field trips and teach local (cultural) impact.

To do less paper/pencil tests & more assessment and activities that are more "real life". We tested water in Shelton & formed some public services not too great. My kids wanted to publish their results in the newspaper. We didn't but I sure had them involved.

Teachers, Pre-Institute Survey

The biggest problems I encounter when teaching science to Native Americans are:

Don't teach science.

A general lack of confidence and stereotypes placed on them by peers, self, other teachers, and/or family.

Making the work relevant to them and therefore they should do it.

Giving the amount of time they need to complete work.

That I know little about the culture and relevant issues. Most of my information about Native Americans I receive from the newspaper.

Attendance and then trying to catch the students up to the class when they have been gone. The other problem I encounter is with students who attend but refuse to do wor in class.

They, like all students, have a wide range of abilities. This past year I had two that were very high academically and fit in very well with their peers, I have had some in the past which were not motivated and didn't want to do a lot. I have never had any behavioral problems, but high absentee rates.

I do not know the culture as well as I would like. At time, I feel like an "outsider" and am not sure if I am overstepping boundaries within their culture.

Real quiet students. I worry if I am really reaching them. I rely a lot on the "teams" to make Native American students "part of the group" and to double check understanding I hope I am reaching them.

Paraprofessional, Pre-Institute Survey

The biggest problems I encounter when teaching science to Native Americans are:

They tend to become bored easily. So sometimes I play classical music or put in a video and make them feel like that they are home.

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Teachers, Post-Institute Survey

The most effective things I could do when teaching science to Native American students are:

Work more in groups. Use examples of their culture whenever possible. More hands-on activities.. Use the tribal community whenever I can.

Hands on, small groups, patience, give time.

Involving them in the learning process, connecting the concepts with their everyday lives.

To attack the teaching of the lesson from as many of the different learning styles as possible.

Make it fun.

Listen to their needs/concerns/fears. Make myself approachable for help. Show sincere interest in their interests.

To respect each child; treat hem with kindness and openness.

Students, Pre-Institute Survey

The best things about studying science are:

You can use the things you learn later on, and the hands on things are fun.

All the important things you learn that you never learned before and the labs you get to participate in.

Learning more about my world. how it changes.

It is the real world we are studying, and it is a topic that affects us all. Seeing it, not just reading about it.

The hands on activities where we can witness the results/effects firsthand.

Doing "hands-on" things like labs & field trips. I like making a mess & noise, smoke, fire, etc.

That you can understand the things around you better when you know about science and that it can help people actually longer. healthier lives. By that I mean that medicine is a very important part of science that influences almost everyone in the world by some means.

Students, Post-Institute Survey

The best things about studying science are:

You learn about lots of stuff you'll use later, and gain interesting knowledge.

You learn and apply what you learn to things around you.

The labs.

That we can use the information in our own lives. Learning by doing experiments/labs.

Labs.

Students, Pre-Institute Survey

The worst things about studying science are:

Taking notes. because I don't write as fast as the teacher talks.

Things you learn but don't quite get and in order to get them, you have to go back and have others try to explain The dissections. I'm not one for biology, that's for sure.

When teachers just have us memorize the names of the things,, and don't go into what they actually do. All the labs I have ever done in school have been so simple that my friends and I knew what the result was supposed to be ahead of time.

The assignments and notes - yes, they're a necessary part of learning, but that doesn't mean we have to like it.

Reading & tests.

When you are studying about something that is too small to see or that you don't quite understand yet. it makes it hard to see a picture of what it is and makes it more difficult to learn.

BEST COPY AVAILABLE

Students, Post-Institute Survey

The worst things about studying science are:

It's hard to memorize all the little details, and some of the fields are just boring, like medicine and if that doesn't work you are totally lost for that section.
There is so much.
The papers.
Complicated math-type problems.
Homework.

Students, Pre-Institute Survey

Skills and knowledge I would like to share with others at the Institute include:

Origami and limnology tests.
All I know about water quality because in school we spent a lot of time with this.
Well, I don't know just my personality. Part of my personality is what I know.
Most of my knowledge and skills are in the areas of biology and animal science.
My experiences painting Sultan's storm drains; my wonderful knowledge of the U. of W.'s campus and my love of the X-Files.
Well, I actually thought of this already. I still can't think of any. Sad, huh?
Dream catchers.
Street smarts. Some people don't have any street smarts and it's make a world of difference in the world today if people would have it.
Ability to work well with others. Speak in front of large crowds with ease. Listen, only listen when someone needs an ear.
Having done work in the environment and how doing the work relates to learning.

Teachers, Pre-Institute Survey

Skills and knowledge I would like to share with others at the Institute include:

Think about it.
Using technology, specifically multi-media, in science instruction.
I'm not particularly skilled in any one area - I do have some crafts they might be interested in.
Creative and easy hands on activities for classroom.
Some hands on and demonstrations that I use.
I guess ideas for labs - I think the greatest is sharing resources and ideas to other teachers. I have gained a lot just by talking with other teachers. I don't feel I've got all the answers - I like to learn from others.
The history, values of the Nav-chah-nulth (my tribe).
I am a new science teacher. This is my first year teaching Earth Science. I am enthusiastic, hardworking, and willing to learn.
I do have a working knowledge of some team contests for kids - coaching Odyssey of the Mind and Math Olympiad. I want to learn about Science Olympiad & how Native American kids feel in participating in these sorts of programs.

Paraprofessional, Pre-Institute Survey

Skills and knowledge I would like to share with others at the Institute include:

The legends and experience I've had on my reservations.

Students, Post-Institute Survey

What are the most important things learned from teachers?

That they're really nice and will talk to you not like teachers at school.
Different styles of teaching.
That they really do have a life (ha, ha).
Are nicer here.

What are the most important things learned from paraprofessionals?
Friendship and having fun.
Some can be really funny.
What are the most important things learned from other students?
How to interact with them in a residential setting.
The art of friendship.
Deal with prejudice.
Are interesting and fun.

Teachers, Post-Institute Survey

What are the most important things learned from students?
That they are smaller versions of adults & they want to do well for the most part. Students and teachers can be friends.
All NA are individuals and have different strengths and weaknesses.
There was not enough time one to one with the students. We did not develop a true (?) "bond" experience so that the interactions with the students were superficial at best.
To step back and let them take over.
They have much knowledge and are naturally inquisitive. Most are not afraid to try.
To provide more chances for hands on activity.
What are the most important things learned from paraprofessionals?
That they are supportive and concerned.
Very good.
Not be afraid to be personally involved in my native students lives as much as they will let me.
What are the most important things learned from other teachers?
That teaching can be fun and humor belongs in the classrooms.
I am really not sure. What ever comes up naturally I suppose.
Have fun & play.
Everyone is a teacher.
Please be quiet and be more observant.
We share similar experiences with our Native students and their is a collective wisdom we all have and can use to engineer success for our students.
Ideas, strategies, lesson plans.
They have tremendous knowledge & experience accumulatively and are a great resource.
To ask more questions and wait 15 seconds for answers.

Teachers, Pre-Institute Survey

Things I would like to learn from the NASON Institute include:
Chemistry, resources.
Learning more about the Native culture, relevance of modern science to Native culture, and how to improve self image for Native students in science.
Working on the Internet - information gathering, a cultural awareness, definitely a better understanding of science & chemistry.
How to - hands on. To feel successful. I have no experience with chemistry. I'm a bit nervous.
General Knowledge about the past issues and problems of the Washington Native Americans. Also, how to teach science to these students and what excites them.
Resources for new hands on teaching, effective ways in dealing with reluctant learners.
A better respect and knowledge of Native Americans and ways to integrate it and diversity into my classroom.
Resources, hands on science, an excitement for science. Get over my phobia with chemistry.

BEST COPY AVAILABLE

Hands on activities to use in my 8th grate science class. Knowledge of basic concepts; water testing, ground (geological) information. Areas you feel I should cover with my class.
Networking with participants. Finding out how others teach science & where they get materials & how they set up lessons and who are great guest speakers and when is the best time to teach and grade to teach certain concepts in science.
How to explain watershed and problems that affect the quality in a way that really means something to children. I really need to understand the whole issue more thoroughly before I can do a good job relaying the info.
Activities that I can take back and easily implement in my classroom.
A better background on what science concepts are taught in the middle school so I can think about integrating math and science activities.
Teaching science in a fun and interesting and relevant way.
Cultural aspects. Environmental science issues. How to do hands-on activities w/o a traditional lab set-up and low budget.

Students, Post-Institute Survey

The most important things I learned from the NASON Institute are:

Lab experiments, my school system can't afford to have any. And what it's like to be awa from home so long.
More about science in general and also about water quality.
Aspects of science that I have not had experience with such as the water testing.
How the Mariners will be the Indians in the playoffs next year.
Learn how to work with other people and learn the other wonders of life I didn't know.

Students, Post-Institute Survey

The best part of the Institute for me was:

The science fair.
Learning a lot of cool things.
The people. I made new friends from teachers to kids.
Lazer-vava & basically everything. It was one of the funnest things I've done.

Teachers, Post-Institute Survey

The best part of the Institute for me personally and professionally was:

Teaching a lesson based on the current focus or related to it.
The hands-on experience. Meeting new people.
The labs - I love the idea of being a chemist. I enjoy seeing things react when mixing and enjoyed the environmental lab at the "Metro."
Having other professionals be able to give me feedback on what I am teaching and
The fun and passion Sara had for science, the care and compassion of Nan, the excitemen I will carry home for science.
Gaining the basic information about chemistry - doing labs, listening to lectures, talking wi Sara about chemistry.
Meeting the people and networking.

Students, Post-Institute Survey

The worst part of the Institute for me was:

Sitting in the back of the van all the time 'cause I'm littlest. It's really bumpy back there.
I almost died in a hurry because I doodled (sic) around and didn't do my science project.
Waking up at 8:00 every morning.

BEST COPY AVAILABLE

Teachers, Post-Institute Survey

The worst part of the Institute for me was:

Trying to learn too much technical chemistry in just a short time.

Being away from home so much. The disrespect that was shown to our instructors.

Having to travel back and forth from Tahoma. I found it rude to see students falling asleep while Sara or John lectured to us. Otherwise I enjoyed myself.

The lack of discussion about and with the students about their lives and how their culture and family influences them. It might have been uncomfortable to do but this kind of information would have been invaluable to me and possibly to the other teachers and future teachers in the class.

I would have liked more time during the day for strategies on teaching Native American students.

Some individuals were real negative at times. Time (schedules) were too loose.

I wish I had read a chemistry book before coming so I would be more prepared.

Students, Pre-Institute Survey

If I could have any job I wanted, I would be:

A paleo-anthropologist.

A pediatrician.

A paleontologist or an archaeologist. To study dinosaurs is fun and I love ancient civilizations.

A veterinarian. I would like to be able to save lives, but I don't think I could handle being a doctor for people. If I failed to save a patient, it would be not as bad if it was an animal, instead of a person.

A freelance writer who was a veterinarian and ran a community environmental awareness program on the weekends.

A DJ on a radio station in Seattle at night, and have a day job at a record store. I love music.

Students, Post-Institute Survey

If I could have any job I wanted, I would be:

An anthropologist or a paleo-botanist.

A pediatrician.

A naval pilot or engineer.

A veterinarian.

A radio DJ or work at a record store.

Students, Pre-Institute Survey

Things I would like to learn but am never taught are:

How those little dots around the elements work.

More about my Native culture. I know a lot but there are other things that I've never learned and I'm not taught, just expected to know.

All the "why" questions. Many times I am taught "how", "when", and "what", but never "why."

How to actually use the things taught to me.

How to improve my writing skills; not grammar or structure, but the idea of the work. Also, more about environmental science, and the county's watersheds.

A lot of things like why things are the way they are. Stupid things. Why the sky is blue? Why isn't there just one language?

Students, Post-Institute Survey

Things I would like to learn but am never taught are:

More about ancient cultures, and how to keep sand from getting in your shoes at the beach.

Better study skill that fit my personality of the 7 ways of learning.

Event Questionnaire

II. Please comment on the Teachers Presentation - Teachers comment on the activity as a learning experience both from the presentation side and the participant side. Students give your viewpoint of the activity as a learning experience.

It's always good to see presentation to get ideas about and lesson plans/ teaching strategies. This is what I will take back with me and use at school immediately. As a participant I enjoy watching different styles of teachers. As a presenter, I enjoyed spending lots of time on one lesson plan and using as many intelligences as I could squeeze into the lesson.

I learned how to turn foul water to purify water. I, also, learned how to do hands on activities with my students when able to teach.

It was possible to spend three or so weeks studying something in depth in anticipation of the presentation. It may have been helpful to have had more direction in what was expected. The very full days in the first 2 weeks made working on projects difficult.

It was interesting and fun to learn about different things in different ways. I also got to se which way I learned best with the different teachers' styles.

It was a little intimidating going before the group. I enjoyed sharing what I do in my class. Other teacher presentations were fun to participate in. I learned some interesting facts and gained ideas for use in my own class.

It was a good learning experience as a science teacher. However, since the focus of the institute is Native Americans, I think all the presentations should be required to have a strong Native American integration of science and culture. (i.e. soils, absorbent, ions, hyperstudio).

I thought these were fantastic. I learned so much. I also learned a lot of different method of presenting things.

It enabled a lot of teacher's to try new stuff or improve upon current lessons. It would be better if we got immediate feedback - ESPECIALLY from the students. I had to "go fishing" to find out what was happening in my lesson as far as teachers and students are concerned.

The teacher's presentations were really good, not only did they get a chance to teach us, but we loved learning about stuff in the fun labs they had planned.

I felt that the teacher presentations were a great learning experience because we not only learned new ideas but also strategies of teaching them. It was interesting to see that were hands on and that the teachers got excited about science. As teachers, I though it was a good experience to teach a lesson.

All the teacher's presentations were great! I learned a lot about teaching styles and got a lot of great information.

I liked it. I could see how different people taught. Plus, I even learned something.

The variety of presentations helped add to my "list" of things I will want to do. Preparing for the lessons helped me think through and organize my activity better - especially since I am a rookie.

BEST COPY AVAILABLE

I think that it was really good that we, as students, got to grade them. After all, it is the students they are going this far and I think that sometimes teachers forget that if they don't present with enthusiasm or a way that kids like then the kids won't learn and it will have been a waste of time.

III. What other activities or events would you like to see included in the Institute?

I would like to see more time for teachers to collaborate with other teachers around a central topic.

None.

More cultural awareness for teachers and students.

Like to see more Native American influence and culture. Too much science and not enough culture. The ECC sessions were great but could be more interactive.

More cultural activities - story telling - maybe have a spiritual leader.

1) There needs to be a direct cultural tie-in for every chemistry lesson given. 2) Other topics (not water resources) must be integrated into the curriculum and tied directly to Native American cultural heritage.

Canoeing!

More learning about Native American culture. A day trip to Blake Island; I went there as a kid and want to go back.

Native American teachers on strategies - cultural.

Lazer shows.

More time for teacher sharing (i.e. teachers bring 2-3 lessons they've taught and share in small groups.)

I think as far as activities it was great. I liked the way the RA's would take us places like Shilshole, downtown, Niketown, and just take us to the Ave. We needed that and I'm glad they were so willing to spend time with us and all the students had fun with all RA's.

IV. Please comment on the student Science Fair.

Great, thoughtful, intelligent work. I think this is probably where they learned the most in the institute. Their participation in the program was apparent in the quality of work they presented.

Some projects were very interesting! Others were obviously put together the night before. For those students, was it valuable?

It was interesting. I could've started earlier on the poster.

Some of the students did an outstanding job. They worked hard up to the last minute. Others, well, there is always different interests and commitment.

Overall glad that all students were able to finish their projects.

It was really great - Some of the kids to my surprise put a lot of effort and thought into it.

A good idea. Perhaps the students should be strongly advised to include a culturally significant aspect to their projects. Either as a historical tie in or current reservation issue tie-in.

It was a really good idea. It got the student involved and working on something bigger than just labs.

I thought it came together well, even though I had been skeptical about it. I think there was too much procrastination though.

I was impressed with many of the student's projects. It was evident which students did not take much time with their projects.

It was really fun.

Interesting and enjoyable. I was disappointed to see a couple dragging in projects not finished and working on them there.

I think we should have been given supplies earlier to work on the project. I also think we should have been told who was judging us. UW staff asks very different questions than teachers and students would and I think many of us felt unprepared.

V. Were there any members of the NASON staff who made special contributions to your experience at the Institute? If so, who were they and what did they do?

Nan - wealth of information, great listener, made this program work, and wonderfully. Sara - energy, love for chemistry/science is great, can't help but get excited about it. Studer TA's - great role models for students.

All members of the staff are great! I appreciate Sara's patience, humor, and caring spirit so much. She made this institute enjoyable for me at times when I questioned why I was here.

Briana - She made it fun, a good learning experience, and she became a real good friend!

John was very helpful. He was always willing to help with understanding or just to visit. Sara was incredibly interested in all of us. She made the learning experience fun. The TA seemed to have a blast with the kids.

Many staff (Aaron, Kateri, Briana) made special efforts to bring participants around Seattle during free times (Pike Place, swimming at Mercer Island).

Everyone of the NASON staff were great and helped make the whole institute better and less stressful..

Nan Little really helped me with my understanding of my teaching style and how I come across in group dynamics. I wish that more of her expertise in Native American cultura anthropology could have been shared with more of the teachers and paraprofessionals.

I thought the staff as a whole did a very good job. They were easy going, pleasant, fun, and I could tell they liked being here.

Sara - very dynamic teacher. Appreciated her love of science. (I learned a lot.) Nan - ver caring person for writing grants for NASON - really knows her way around the Native community. A wonderful ambassador.

Yea. Megan & Aaron. Megan for taking us places with the van. Aaron for taking us to lazervana.

Sara really encouraged me by bringing chemistry concepts down to my level. She also made it fun. This will be a goal for me this school year.

I think Briana made the biggest contribution to me having a great time. She is great. I jus loved her to death. I also thought Aaron did a really good job. To tell you the truthful I don't think you could have picked better RA's anywhere in the world. But Briana wa still the best!

VI. Were there any members of the NASON staff who inhibited your learning or experienc at the Institute? If so, what did they do or not do?

No way!

At first I felt a bit overwhelmed by the lectures of one staff member, but those lessons became easier to understand. That person also took extra time to help me.

None.

No.

During some labs, some TA's were joking/playing/talking with students instead of letting the students focus on the lab. I particularly remember during the "abnormal water lab that all the TA's were water fighting with my entire lab group. It was kind of frustrating. The obvious tension between the 2 coordinators was distracting and disturbing.

The lecture only approach to some of the chemistry was very difficult for some of the participants. It is also not relevant to the 7 intelligences information that should be pa of every lesson from preschool through college.

There were so many people I can't just select a few. Thank you, everyone for making NASON such a wonderful program.

No.

Yes. No name, not a staff though.

I felt self-conscious about being questioned after a "learning" time was over.

BEST COPY AVAILABLE

There were no people who inhibited to my leaning, but Shawn did annoy the hell out of me. He was the only RA I couldn't stand and believe me I was not the only student who felt this way. We all did.

VII. Additional Comments?

This has made my summer meaningful and given me energy to return to school to teach with renewed vigor. Science definitely on the agenda.

Thank you! Thank you! I truly value what was presented to me over the past four weeks. Would it be possible to have an institute just for lower grade teachers so we aren't lost 90% of the time.

I loved it here. I'm so glad I came. Thanks.

Some more structure for the kids in the dorm. But I know it is an exciting time and a rare opportunity. This was a very positive experience. Thank you.

I'd like to come back a third time.

This is a valuable program that needs more emphasis upon the needs of the students and the teachers who work with them.

I had a very good experience. I thought there was a good mix of people and had fun.

Great program - I would highly recommend to teachers who have Native students.

FUN!

Stress "time" more, as far as departure is concerned. Hold people accountable. Thanks for a great month and all your help. Thanks for an excellent introduction into chemistry.

I would just like to say I have met some great people here.

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☐ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☒ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").

ERIC Full Text Provided by ERIC