An Assessment of the 2010 Youth Engagement through Science Program

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Photos: Courtesy of Stephanie Barrette and Lauren Loh, former OP&A interns.

PREFACE

Creating and sustaining meaningful museum programs for teenagers is a challenge for every museum. Consequently, the Office of Policy and Analysis (OP&A) was especially pleased to participate in an evaluation of the initial *Youth Engagement though Science (YES!)* program developed and implemented by the National Museum of Natural History (NMNH) Department of Education and Outreach. This report presents findings from the 2010 assessment and forms the basis for improving the program in 2011.

In OP&A, Zahava D. Doering had primary responsibility for designing the study and interview guides, coordinating the data collection, and interviewing NMNH scientists and some students. Two extraordinary interns, Lauren Loh and Stephanie Barrett, assisted with all aspects of the evaluation, undertook responsibility for interviewing the *YES!* participants, transcribed interviews with the scientists, and help draft report sections. When they returned to college, Caitlyn Stewart, also an intern, helped draft sections in this final report and reviewed the final product. Kathleen Ernst, OP&A staff member, reviewed the report and made valuable suggestions.

Carole M. P. Neves, Director
Office of Policy and Analysis

INTRODUCTION AND METHODOLOGY

Introduction

The Department of Education and Outreach, National Museum of Natural History (NMNH) asked the Office of Policy and Analysis (OP&A) to assess the impact of and experience in the 2010 *Youth Engagement though Science (YES!)* initiative on its participants. Ultimately, the goal of this initiative is to give students a competitive edge in today's knowledge based society. This report summarizes OP&A's results, obtained primarily through personal and telephone interviews with high school participants,

personal interviews with the scientists they worked with, and observations of program activities.

Background

The Youth Engagement though Science (*YES!*) program enrolled 15 rising high school sophomores and juniors from the Washington DC area in internships at the National Museum of Natural History.[1]

Summer

During six weeks in the summer of 2010 (June 28 to August 6), interns worked on research projects with NMNH research scientists[2] and participated in educational programs designed for them. *YES!* interns worked on a host of different science projects, ranging from preparing 70 million year old fossils, to caring for and handling live insects, to helping scientists document the diversity of rare marine worms, deep-sea corals, and insects. Interns also got the opportunity to go behind-the-scenes into NMNH's vast research collections – seeing rare collections including meteorites, mummies, and mammoth skulls. They were also exposed to genetic research in NMNH's Feather Identification Lab.

The program hoped that they would acquire valuable technological skills from the science projects and enhance their written and verbal communication skills through guided workshops hosted by the Center for Minority Achievement in Science and Technology (CMAST). Working with museum educators, interns helped visitors experience the NMNH in interactive ways. They helped visitors examine evidence collected by archaeologists using the tools of a forensic anthropologist, learned and

[1] See Appendix A for students' demographic characteristics and Appendix B for scientists' departments, student science research, and final outreach projects.
[2] See Appendix B.

provided information about fascinating insects in the Insect Zoo, and interacted with younger visitors in the NMNH hands-on Discovery Room.

At the end of the summer session, the *YES!* interns were challenged to create educational activities and present them to museum visitors, thus combining their research with scientists and science education skills. "The *YES!* Intern Is In" event took place in the *Sant Ocean Hall* in the temporary exhibit space (SI Lab) on Wednesday, August 4 and Thursday, August 5, 2010.

On Saturday, September 25, interns presented their interactive activities again at NMNH's Centennial Festival. They were located throughout the museum – in the Ancient Seas Hall, Ground Floor Lobby, Insect Zoo and Sant Ocean Hall – showcasing the research they did with museum scientists over the summer.

For the six-week summer session participation, students received a stipend of $2,500. Students were required to be in the museum for 30 hours/week. The hourly salary, approximately $14, exceeded the minimum wage they could have earned in most jobs available to them.

Fall

In the fall (2010), coming to NMNH on 8 Saturday mornings, the students continued with their educational and career development by starting college preparatory activities. The students engaged in a variety of workshops and activities focused on increasing their understanding of and preparation for traditional college entrance exams, searching and applying for scholarships and grants, and ultimately college survival. The fall session concluded with a tour of the Johns Hopkins University in Baltimore. Initially, program staff hoped to provide an opportunity for students to shadow current college students and participate in a panel discussion about their experiences preparing for and surviving the transition from high school to college. However, timing and logistics prevented these activities from being scheduled.

Methodology

Design

OP&A proposed an analysis of qualitative data as the basis for the assessment.

> Students were interviewed either in person at NMNH or on the telephone early in the early fall; i.e., while the summer experience was fresh in their minds. Interviews were recorded. (To comply with research regulations, students' parents were asked to sign a parental consent form.)[3]
>
> All but one of the participating scientists were also interviewed either in person at NMNH or on the telephone in early fall; i.e., while they still clearly remembered the interns. Interviews were recorded.
>
> Students were interviewed on the telephone at the end of the fall program. Interviews were recorded. (Again, parents were asked to sign a consent form.)

In addition to assessing the success of the initial initiative, a focus of the analysis was identifying factors that are needed for an NMNH-wide program with more participants.

Report Contents

Following this Introduction, the next section will present our Findings following the chronology of the program: selection process, staffing, projects, program activities, project presentations, college preparatory activities, and university visit. The Conclusions and Observations section includes OP&A team conclusions as well as conclusions drawn from the students and scientists. OP&A's observations and suggestions for the next iteration of YES! are interspersed in this final section.

[3] See Appendix C for parental consent form.

FINDINGS

Selection Process

Students

Program participants were accepted on the basis of applications, without personal interviews (phone or in-person). The late funding of the YES! program meant that outreach efforts to generate a large pool of applicants were not feasible. Thus, relying on referrals from schools and colleagues generated the student pool. Presumably, applicants were those who demonstrated a genuine interest in the field of science and lacked opportunities to pursue science programs in their schools or communities. In fact, many students admitted a marginal interest in science, were in the program to add an item to their resumes, had no other options planned for the summer, etc.

> A student who said that NMNH was his favorite museum as a kid told an interviewer that he was pressured by his father to do the internship, but he thought that NMNH was the "coolest place to do an internship."

> A girl who heard about the program through her mother, a white-collar professional, said

> "I just thought it'd be awesome to be able to say I worked with such a famous organization."

> One girl, encouraged to apply by a high-school counselor said, "My summer was kind of boring last year and I thought this would be a good experience."

Based on student and parent comments, the majority came from middle-class homes. The group was composed of 10 students of Latino descent (4 male and 6 female), four African-Americans (2 male and 2 female), and one whose family migrated from an African country. They came from 12 different area schools, including three private schools. One student was home schooled. At the start of the program, all but two were 9th graders; the youngest was 14.5 and the oldest had just turned 17. They were clearly motivated students, with an average grade point average of 3.36 (+.36).

Retrospectively, most of the students recalled that they had mixed impressions and expectations, generally seeing the program as more classroom orientated ("From the information we got, I thought it was going to be more like school," or "Helping [scientists] with whatever needed."). Some were more pragmatic, as they had no clear summer plans ("I wasn't really interested in science, but I go to a math and science school. I wondered what will come out of it if I participated.")

Scientists

As with the students, selection of the scientists was on a fast track, excluding any screening by *YES!* staff, review of projects, or orientations to the program. Many of the scientists had no experience with young students and a few admitted that colleagues pushed them into accepting interns or felt it was their obligation to the museum to accept students.

> "They were in need of scientists to host [students] and they didn't have enough, so they [*YES!* staff] were scrambling to find some staff that would be able to host them. I said that 'Oh, it might be interesting'"

> “I was signed up by […] and I was not happy that I didn't give my consent before signing on to the project. I did not go out looking for anyone."

At the same time, some scientists saw the program as a unique opportunity to contribute to science or as a positive response to their own past experience.

> "I agreed to participate because I believe that science needs to be reaching into under-represented ethnic groups and encouraging participation. The best time to do this is when children are younger and still flexible regarding their career interests (in fact, they are not thinking about 'careers' yet, most of them, but rather about what interests them). This seemed like a worthy attempt to engage bright, young, and potentially disadvantaged kids. Even if they choose something else for a career, they will have had a positive science experience that may influence their lives positively in ways we cannot anticipate." The scientist added, “In reality, they were not what I’d describe as needy.”

> “I joined because it sounded like a terrific program and the big kicker was going to be that follow up afterwards.” The researcher continued, “I have been taking interns ever since I’ve been at the museum - giving back for having opportunities, and, pragmatically, interns get [her] work done.”

Projects

Students were not aware that they would be assigned research projects instead of having choices. Some students did not enjoy the research projects they were assigned.

> One boy felt that all the tasks should have had more meaning because, “other kids were saying they had a lot of meaningless tasks…I wish they could have the same experience that I had”

> One student wished they had another student’s experience instead of their own, “would've liked to experience what the other kids were doing – like FossiLab.”

> “Just make sure the scientists know what the interns are here for; we aren’t here to get their coffee.”

Some of the Scientists also had problems with the projects. They also expressed concerns about a need for more meaningful projects.

> One scientist asked, “are there enough meaningful projects that could be designed for the next goal of this kind of program?”
>
> “I thought it was deadly what some scientists had their students doing. I was appalled! It was almost kind of criminal that these projects were happening. Someone has to figure out a way for that not to happen. If you’re not going to do it correctly, you shouldn’t do it at all. There’s no better way to turn someone off from science than to just have them scanning all day.”
>
> “Real science projects generally take a lot of time. They need to find something they can do without supervision.”
>
> One scientist expressed concern that the projects had a disconnected feeling and that he, “didn’t know how much of what they were doing was related to the presentation.”
>
> A scientist was under the impression that the students chose their projects: “I think [The 2010 *YES!* Program Coordinator] was involved in the placement but it had to do with what the kids asked for and then I think they must have been given a list of projects and they picked and then shuffled out that way.”
>
> One scientist believed there should be “consideration of students’ interest on who they want to work with.”
>
> “The students weren’t allowed to choose their project, which probably would have motivated them more if they had that option.” This scientist thought the six weeks was too short. He really couldn’t develop something [in that amount of time].

Partnerships

Partnerships, i.e. dual assignments of two students to one supervisor, also were hot topics among the students. The majority were in favor of working with a partner, as they believed that it enriched the experience and provided companionship.

Very few of the students had comments such as this:

> "I'm a kind of a loner when it comes to stuff like this so I liked working by myself."

The majority of the students deeply advocated for partnerships:

> "I think it would be best to have partners because it would make the work a lot more fun"
>
> "I got really bored just scanning pictures all day. It would have been more fun with a partner so I could have someone to talk to and hang out with."
>
> "Becomes more fun, can discuss projects, races to see who can scan more pictures."
>
> One student who had a partner was very happy with the experience and she believes that four hands are better than two. "I had an awesome partner. It was great to share that experience with someone who has the same interests."
>
> One scientist expressed that partnerships help students "develop great friendships" and if the project has room for two people then partnerships could be a good idea.
>
> Another scientist had a different take: "One student intern would have been much better so it could be more focused. There are limitations with what you can teach with different personalities. Two students worked this time."

Rotations

Towards the end of the program, Public Venue Rotations were held in the Discovery Room, Butterfly Pavilion, SI Lab, and at the various Discovery Carts/Exhibits at NMNH. This aspect of the program garnered much positive feedback among the students; many claimed that this was their favorite part of the program. They enjoyed having the opportunity to have a different experience from the usual routine in the lab with their scientist. Students were curious to see what the other participants were working on and many wished that rotations had begun earlier in the summer session. From the perspective of the scientists, however, these were further distractions and interruptions of the work.

Rotations were a hot topic in many of the interviews and a few students wished they had begun much earlier. One student in particular disliked that “rotations did not begin until the end of program.” Many students had comments similar to these:

> “Allowing job rotations, interns can choose what they want to do at the museum.”
>
> “Add more rotations so students can experience different projects – especially in Entomology because there were so many students in that department.”
>
> “Final two weeks – one day with bugs, one day with geology – being exposed to other projects – rotate partners.”
>
> One scientist said rotations should have been implemented earlier for a “broader exposure.”

Length

Both students and scientists expressed interest in a longer program, either hours/day or weeks/summer.

One student said that because three to four hours a day were for the *YES!* program she had scheduling conflicts with athletics:

> “I would like to have less days with longer hours so we can go to practice for our teams.”
>
> For one student, her friendship with the other students was her reason that she “doesn’t want the program to end.”
>
> Another girl said, “It would be nice to mix it up some. During the fall, we could go back to what we were doing in the summer. I would like to return to the work I was doing then.”
>
> One boy, however, said that meeting for three hours on Saturday was, “good timing.”

The scientists had varied views:

> “I thought the six weeks was too short. I really couldn’t develop something... Probably, full time weeks [instead].”

> “The time students spend with us really is not sufficient for them to engage in too much research in an independent way. This leads to activities that focus on ‘doing things’ instead of understanding what one is doing and why.”
>
> “We could’ve done more if we had more time”
>
> “The time it takes to train someone vs. the time they get to work for you is a big determinant of what scientists can do for the students,” was the point of view of another scientist.
>
> “It was too long for me. Three weeks would have been better.”
>
> One scientist appreciated the little time because it was “less difficult.”

Attendance and Pay

A number of students had significant absences during the program. The students did receive $2,500 for six weeks – more than most SI college-age interns. Some scientists and students had concerns about the stipend.

> One scientist said, “I don’t think they had time to target students very well. The kids weren’t the neediest and that was what the stipend was for.”
>
> Another scientist mentioned that his student “seemed more interested in what the stipend was” than in participating.

College Visits

Whether or not a single or multiple visits to a college campus are scheduled should depend on how the audience for the program is defined. Only one or two students were potential Johns Hopkins or Princeton candidates. The students had mostly positive comments about the visits, but one scientist was a bit uncertain about the program’s “usefulness.”

One scientist was “slightly confused that they are doing it early for 10th graders.”

Almost as if in response, a student said, "I mean yeah, I'm only in 10th grade. I think it's still helpful though. It's best to start early so you know what to expect."

Another student said, “Even though I still have a few years before college, it’s good to start early. If you wait until senior year, it makes you hurry. It’s better to get everything together now.”

One student had many things to say about the program: "I like it, it's very informative," and "It's nice that they are able to provide this information," and "My mom has a better idea of what to do when applying for colleges."

Staffing

Students and scientists praised the one full-time staff Program Coordinator assigned to the program in 2010. Some scientists expressed concerns about the last minute staffing.

One scientist commented that the staff and program made them, “invigorated about being involved with [the students].”

Another scientist became involved because “they were scrambling to find some staff that would be able to host students. So I said that ‘oh it might be interesting.’”

Many of the scientists praised the [2010 *YES!* Program Coordinator], saying she had an “ability to speak with both sides – scientists and students” and an “amazing relationship with kids.”

The students also had nice comments about the staff, especially the [2010 *YES!* Program Coordinator] and the staff for the college prep courses:

“[The 2010 *YES!* Program Coordinator] was always there. She encouraged us to volunteer once the program is over if we are interested.”

"Could you make sure that [the 2010 *YES!* Program Coordinator] knows how much we love her? Her being in the program really motivated us and is really a big reason why we loved the program so much. She's awesome!"

"[The College Prep staff member] is always finding us opportunities to succeed. He's always said that he'll do everything possible to help us."

CONCLUSIONS AND OBSERVATIONS

In sum, in order to remedy the issues that arose in the inaugural year of the *YES!* program, there is much to be learned from the experiences of the students, scientist supervisors, and *YES!* staff. Below are OP&A's recommendations and summary of events.

Program Goals

The goal of the program was unclear to some students and scientists. Over the course of six short weeks, students were expected to accomplish a great deal: conduct scientific research with their scientist supervisor; attend courses that were hosted by the Center for Minority Achievement in Science and Technology to improve communication skills; prepare a public presentation; and attend courses that provided information on universities and colleges and the financial services available to them. The tug-and-pull of the resulting schedule sent conflicting signals to the students about the overall goals. Is the program about nurturing an interest in laboratory science? Stressing the importance of education as a road to a successful career? Encouraging careers in science museums? Assisting culturally challenged students?

Selection Process:

Students:

The majority were rising sophomores or juniors who, due to lack of time, were accepted without interviews. Presumably, applicants were those who demonstrated a genuine interest in the field of science and lacked opportunities to pursue science programs in their schools or communities. In fact, many had little interest; they were in the program to add an item to a resume, had no other options to fill their time in the summer, etc. Is this what the program wants? The selection process should be clearly linked to the goals. However, whatever the goal, we suggest personal or phone interviews prior to acceptance. For many, much of the college related material is too abstract; a few were too young for the program requirements. The majority were middle-class students who probably will go to college with or without participation or further encouragement.

Scientists:

Ideally, the program should consider a broader definition of staff to supervise *YES!* students and include scientists, science educators, exhibition developers, etc. They should be individuals who act not only as supervisors for the students, but also as mentors. People-oriented personalities would make a difference. Of those we interviewed, only two expressed an interest in repeating the experience. Ideally, selected staff should attend a seminar/discussion to better acquaint them with the idea of working with high-school students. There is the issue, for each 'science' supervisor, of how to best serve the student's needs while also ensuring that their primary work does not suffer from their involvement in the *YES!* program.

Projects

A major factor in student satisfaction with *YES!* were the tasks that students did with their scientists. Some students were given tasks such as scanning papers in a remote room or other repetitive tasks. The drudgery and monotonous aspects of laboratory science were communicated to some – with negative impact. Many expressed a desire

to have the option to choose their projects in order to engage more of their personal interests. This leads to the suggestion that ‘science’ supervisors clearly define projects or activities, if projects are to be part of the program.

Partnerships

Partnerships, i.e. dual assignments of two students to one supervisor, also were hot topics among the students. The majority was in favor of working with a partner, as they believed that it would enrich the experience and provide companionship. As one said, “I got really bored just scanning pictures all day. It would have been more fun with a partner so I could have someone to talk to and hang out with.”

Rotations

Toward the end of the program, Public Venue Rotations were held in the Discovery Room, Butterfly Pavilion, SI Lab, and at the various Discovery Carts/Exhibits at NMNH. This aspect of the program garnered much positive feedback among the students; many claimed that this was their favorite part of the program. They enjoyed having a different experience from the usual routine in the lab with their scientist. Students were curious to see what the other participants were working on and many wished that rotations had begun earlier in the summer session. From the perspective of the scientists, however, these were further distractions and interruptions of the work.

Attendance and Pay

A number of students had significant absences during the program. To decrease the number of missed sessions and to increase commitment, a demerit system, with fiscal penalties, might be devised. Students did receive, after all, $2,500 for six weeks – more than most SI college-age interns.

College Visits

Whether or not a single or multiple visits to a college campus are scheduled becomes an integral part of defining the audience for the program. As best as we could tell, only one or two students were potential Johns Hopkins or Princeton candidates. Montgomery College, University of Maryland, or Towson State University might be more within reach. In addition, many of the area colleges have Minority programs that tailor visits for outside groups/students. Collaboration with such a program might be explored, if that's the audience definition.

Staffing

Students and scientists all praised the one full-time staff Program Coordinator assigned to the program. However, additional staff might join the team in order to divide duties. An Education Specialist to assist in curriculum development and implementation of daily intern activities might be appropriate. This person would provide students with the context needed to understand and navigate the Museum's public venues, assist in the development of its educational outreach projects, and monitor the interactions and progress of students and 'scientists.' The Program Coordinator can then act as caretaker for the administrative needs of the *YES!* program.

Appendix A – 2010 Students' Demographic Characteristics

Characteristics		Number
School	**Location**	
Benjamin Banneker SHS	DC	1
Bell Multicultural	DC	1
Bishop O'Connell HS	VA	1
Clarksburg HS	MD	1
Holton-Arms School	DC	1
Homeschooled	MD	1
Jefferson Science/Tech HS	VA	1
McKinley Tech	DC	2
Montgomery Blair HS	MD	2
Parkdale HS	MD	2
Phelps HS	DC	1
Sidwell Friends	DC	1
TOTAL		15
Age		
Fourteen		6
Fifteen		4
Sixteen		4
Seventeen		6
TOTAL		15
Ethnicity/Race		
Latino		10
Black/African/American		5
TOTAL		15

Appendix B – 2010 YES! Program Project List

Department	Contact	Title	Project Description	Intern(s)
Invertebrate Zoology	Stephen Cairns	Chair of Invertebrate Zoology /Research Scientist	**Digitizing Corals** The intern will scan SEM (scanning electron microscope) negatives of corals as well as scan coral images from original published photographic plates. She will then invert the negative images, add metadata, and post the images to EMu, our electronic cataloging system. She will also extract electronic coral SEM images from CDs for posting to Emu. The intern will learn to cross reference data from original log books, plate captions, CDs, and SEM labels to establish accuracy of the metadata. Some original SEM photography may be attempted, if the timing and need is appropriate. ***Student Final Project: Mystery of the Deep Sea: Corals	1
	Kristian Fauchald	Research Zoologist, Invertebrate Zoology	**Polychaete Worm Project** The interns will digitize, proofread and publish online scientific descriptions of polychaete worms. Accompanying illustrations, where permitted by copyright, will be cropped, photo-edited and tagged to accompany the descriptions. They will concentrate on a selected family or group of species and create a comprehensive online library for the taxa selected. ***Student Final Project: Weird but Wonderful: Opening a Can of Worms	2

	Jennifer Hammock	Zoology Technician, Invertebrate Zoology	**Nemertean Worm Project** The interns will digitize scientific literature and select descriptive text to be published in an online database of Proboscis or Nemertean worms, along with illustrations and references. Tools include scanning and optical character recognition software, photo-editing software and an online publishing platform (LifeDesk or Scratchpad). ***Student Final Project: Dive Into the Unknown: Nemertean Worms	2
Entomology	Terry Erwin	Entomologist, Chair of Entomology Department	**Beetle Specimen Data-basing and Georeferencing** The intern will work with special collections from South America to build a digital library for those specimens in the collection. The Coleoptera Unit in the Department of Entomology is the steward of some 12 million specimens. Each specimen with its associated label data represents a data swarm that can tell us a lot about the environment present when the specimen was captured. However, most of the collection has not been data based, nor georeferenced. ***Student Final Project: Diversity in Our Backyard	1

	F. Christian Thompson (Ximo Mengual, postdoctoral fellow)	Adjunct Scientist, Entomology	**Creating a virtual (online digital) fly (Diptera) collection** The intern will create a virtual fly collection as part of a larger project to capture all known information about insect species. The first step is to convert information now preserved on paper or as specimens to digital formats. Then this information can be disseminated online via vehicles like the SI Collections Search Center and the Encyclopedia of Life. She will enter and edit information from publications into a database; make and revise digital inventories of our collections, both of literature and specimens; and make digital images of the specimens. The concepts of nomenclature, taxonomy, biodiversity, local faunistics and the critical importance of flies to humans and our environment will be covered. ***Student Final Project: The Louse You Didn't Know About	1
	Ted Schultz (Jeffrey	Research Entomologist,	**Ant Lab: Arthropods of South America**	1

	Sosa-Calvo and Eugenia Okonski)	Entomology	The intern will help to sort ants and other arthropods in leaf-litter samples collected in South America. Members of the Smithsonian AntLab have travelled to many locations in South America (Guyana, Argentina, Peru, Colombia, Brazil, Suriname, French Guiana) and collected ants. One of the main ways we collect is to use "Winkler eclectors" to extract ants from the leaf litter. The samples contain many new as well as rare or poorly known species. The intern will work on sorting the leaf-litter samples, sorting out the ants and other groups (aculeate Hymenoptera, mites, spiders, heteroptera, etc.). She would be guided by Jeffrey Sosa-Calvo, who collected many of the samples. She would also work with Museum Specialist Eugenia Okonski. ***Student Final Project: Amazing Ants: Small yet Sophisticated	
	CJ Geraci	Visiting Scholar, Entomology	**Ecuador Canopy Biodiversity Project: Imaging Amazon Rainforest Beetles**	1

			The intern will use Adobe software to process and digitally edit images taken of beetles for use in scientific, education, and outreach materials. He will be trained how to use Adobe Photoshop for digital imaging. This project is part of a 15-year study on the impact of oil extraction and road building on Amazon rainforest biodiversity. ***Student Final Project: The Best of the Beetles	
	Sheila Morita	Fellow, Research Collaborator, Entomology	**Databasing our Diversity in Diptera** The intern will collect and record information from specimens in the Entomology Diptera collection. This task requires manual dexterity and the ability to work with small delicate objects. He will be trained on use of a microscope and how to work various computer software programs, especially Excel. ***Student Final Project: Diversity in the Insect World	1
Insect Zoo	Dan	Museum	**Insect Zoo and Butterfly Pavilion Internship**	2

and Butterfly Pavilion	Babbit	Specialist, O. Orkin Insect Zoo	This hands-on internship will give the interns the opportunity to support the Insect Zoo and Butterfly Pavilion staff in many aspects of the exhibit's daily operations. They will assist with the plant care and animal husbandry in the lab and exhibits, interact with museum visitors, maintain clean conditions in the exhibits and lab, and work with staff to ensure butterfly containment. ***Student Final Project: Fun Facts about Insects and Tarantulas!	
Paleobiology	Abby Telfer (Scott Wing)	Museum Specialist, Paleobiology	**Fossilized Charcoal** Natural wildfires have an important influence on vegetation. Many kinds of plants grow best after a burn, others are easily killed by fire. This project is directed at understanding the frequency of fire on a 73 million year old landscape at Big Cedar Ridge in Wyoming. ***Student Final Project: Wild Fire	1

			Partially burned, or charred, plants can be preserved as fossils because the components of the plant that would normally be decayed by bacteria and fungi are “cooked” out by the heating. The main activity of this project will be to remove fossil charcoal from rocks. The rocks are ~73 million years old, and come from a place called Big Cedar Ridge in Wyoming. The interns will soak the rocks in water and soap to break them down, then sieve the sediment and separate out any pieces of charcoal. The charcoal bits will be examined under a low-power microscope. The students will look for identifiable pieces of charcoal (sometimes even very delicate parts like flowers can be preserved this way), and also weigh the total amount of charcoal in each sample. ***Student Final Project:	
	Bill DiMiche	Research Geologist,	**Seed Fern Insect Damage**	1

	le (Conrad Labandeira, Greg Stull)	Paleobiology	The objective of the research will be to scan collections of the Pennsylvanian-age seed fern Macroneuropteris scheuchzeri for insect damage. The intern will be instructed in what to look for. All specimens potentially bearing such damage will be photographed for further evaluation by the curators. In such cases where preparation is warranted, the intern may prepare fossils in the NMNH FossiLab,or photograph fossils in that facility. She will work collaboratively with other interns and with curators Bill DiMichele and Conrad Labandeira. ***Student Final Project: The Importance of Plant Fossils	

Appendix C – 2010 Parental Consent Form

Parent/Guardian Informed Consent Form

***Youth Engagement through Science* (*YES!*) Program Study**

A study of *YES!*: Your child is invited to participate in a research study for the *YES!* program at the National Museum of Natural History. The study will be conducted by the Smithsonian Institution's Office of Policy and Analysis, which regularly studies Smithsonian museum programs. The purpose of the study is to investigate ways that the *YES!* program can be improved in the future. The study involves two brief interviews (15-30 minutes) with your child about his/her interests in science, experiences in the *YES!* program, and suggestions on how to improve the program. The first interview will take place soon and be about the *YES!* Summer program. The second interview will take place when the fall *YES!* Program is completed.

Benefits of Participation: First, your child will have the opportunity to reflect on his/her experience with the program and detect areas of potential interest and growth. Second, the improvements on the program made based on your son's/daughter's experience may benefit others in the future. Third, your child's experience will improve professional understanding of the ways that the Smithsonian can assist youth in developing their interests and abilities.

Risks: Participating in this study poses no risks that are not ordinarily encountered in daily life.

Voluntary: Your child's participation is voluntary. He/she may decide to stop participating at any time without penalty. Also, you are free to withdraw your permission for your child's participation at anytime for any reason. It is his/her right to refrain from answering any question he/she does not want to answer.

Confidential: The interviews will be audio recorded and recordings will be kept confidential. Only members of the study team will hear them. Interview audio files will be

stored with the Office of Policy and Analysis. Once transcription is complete, the audio files will be destroyed, within one year after the interview is completed. Once the audio files are destroyed, your son/daughter's name and voice will not be connected to the data in any way. Information and comments from the files may be used in professional publications and/or presentations, but your child's name, or any other unique information that someone potentially could use to identify your son/daughter, will never be reported or released. The only individuals who will have access to the audio files, transcription files, and signed informed consent forms are the Smithsonian researchers at the Office of Policy and Analysis. Your privacy will be protected to the fullest extent of the law. The summary report of the study will be posted on the internet and will be available to all participants.

I have read and understand the above, I voluntarily give permission for my child, _____ to participate in this study, and I understand that I may keep a copy of this form.

_____

_____

Parent or Guardian Signature Date

If you have questions about this research project, do not hesitate to contact one of the principal investigators involved in this research study:

Zahava Doering, Ph.D., Senior Social Scientist, Office of Policy and Analysis, Smithsonian Institution, Washington, DC (office: 202-633-5588) (doeringz@si.edu)

Andrew Pekarik, Ph.D., Program Analyst, Office of Policy and Analysis, Smithsonian Institution, Washington, DC (office: 202-633-5593) (pekarika@si.edu)

You can also contact the Smithsonian Institution's Institutional Review Board with any questions or concerns about the rights of participants in research at 202-633-7110 or ospmail@si.edu.