

An Assessment of the 2011 Youth Engagement through Science Program

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Photo: All photos courtesy of So Mi Park, OP&A intern.



Preface

Creating and sustaining meaningful museum programs for teenagers is challenging for all museums. Consequently, the Office of Policy and Analysis (OP&A) was especially pleased to participate in the assessment of the second year of the *Youth Engagement through 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 2011 assessment and forms the basis for improving the program in 2012.

In OP&A, Zahava D. Doering, working with Kathleen Ernst, had primary responsibility for designing the study and interview guides, coordinating the data collection and interviewing NMNH scientists and students. Three extraordinary interns, Ah-Jin Lee, So Mi Park and Andrew Goodhouse assisted with all aspects of the assessment, undertook responsibility for interviewing the *YES!* participants and transcribed scientists' interviews. Ah-Jin and So Mi were joined by Caitlyn Stewart in drafting report sections and reviewing the final product. I thank them all.

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Introduction and Methodology

Introduction

The Smithsonian's National Museum of Natural History (NMNH) began the *Youth Engagement through Science* program (known as *YES!*) in the summer of 2010. The program was continued the following year, in the summer of 2011, with more participants and changes based on the 2010 OP&A assessment. NMNH has applied for funding so that an expanded version of the *YES!* program could launch in 2012. The Smithsonian in general has a proclaimed interest in training the next generation of scientists and the *YES!* initiative furthers that goal through its six week summer intensive experiential learning process, followed by nine weekly fall seminars.

The goals of the *YES!* program, as stated by the NMNH are as follows:

- Increase access to educational and career development opportunities in science for Latino youth in the Washington D.C. region.
- Increase interest in conducting research, critical thinking, communication, and other skills necessary to be competitive in a knowledge-based society for Latino youth through engagement in authentic research activities.
- Enhance Latino youths' view of science as a viable career track and provide college preparation tools that will support them in the pursuit of science careers.
- Enhance leadership ability of youth participants to engage their communities in the work of the Smithsonian.

YES! provides selected students with the opportunity to: conduct scientific research with an assigned scientist supervisor; attend courses hosted by the Center for Minority Achievement in Science and Technology (CMAST) to improve communication skills; attend the Cross-Cultural Communication Experience¹, attend a session of the Museum Education Practicum², and create a final presentation on what they learned during the *YES!* program.³ Every student is paired with a scientist who acts as both mentor and supervisor. The scientists in the 2011 program were staff volunteers from either the NMNH or the National Zoological Park (NZIP). Students received a stipend of \$2,500 for their participation in the *YES!* program.

In summer 2011, the *YES!* program had 24 students at the start of the summer, with two dropping out, for a total of 22 students at summer's end.⁴ Three of the students in the summer 2011 *YES!* program also participated in the 2010 *YES!* program. Attendance during the summer 2011 *YES!* program was near perfect, although a few students were tardy until spoken to about coming in on time every day. The students, primarily ages 14 to 16, attend local high schools in the Washington Metropolitan Area.⁵

Since the beginning of the summer 2010 *YES!* program, the Office of Policy and Analysis (OP&A), has been assessing the program and providing feedback to the NMNH Office of Education's program coordinator.

Assessment Goals:

- To understand the *YES!* program from the students' perspective in order to improve future programs.
- To understand the program from the scientists' perspective to help with the development of future programs and the extended *YES!* program at NMNH.
- To assess the benefits and costs of the program for individual research staff.
- To look at how the program could be implemented on a larger scale to benefit the NMNH and potentially other Smithsonian museums.

¹ The students received training in cross-cultural communication and practiced what they learned with rotations as volunteers in the *RACE* exhibition at NMNH.

² The students worked with Education Specialists and Technicians in the Office of Education and Outreach to learn first-hand how the museum communicates science to the public, and they participated in some of the museum's educational programs.

³ See Appendix A for a list of the student projects, selected descriptions, and posters.

⁴ One student dropped out before the program started and another during the program due to ill health.

⁵ See Appendix B for a list of students' schools and Appendix C for a list of the participating scientists from NMNH and NZIP.

Methodology

During both years of OP&A's assessment of the *YES!* program, the OP&A team consisted of senior staff members and interns. In 2011, two senior staff members and four interns worked on various phases of the program. In general, the staff interacted with *YES!* education staff and the scientists and the interns interacted with the program participants.

Before the *YES!* program began, OP&A received the application essays of students accepted into the program. This helped the OP&A team understand the participants' stated motivations for participation and their demographic characteristics. (Permission for OP&A to conduct this study is included in the parental consent letter).⁶

Another method of data collection was observation by OP&A staff and interns of the *YES!* parental orientation⁷, the special training for the scientists, and some of the classes and activities including training to assist with the *RACE* exhibition, a field trip to the Museum Support Center (MSC), and behind-the-scenes tours at the museums and NZP.

The main source of data for the assessment, however, came from personal interviews. OP&A interns interviewed the students, face-to-face, before the end of the program. Of the 22 students in the program, 20 were interviewed during the last week. Staff conducted interviews with the scientists, almost all in person, a week after the end of the *YES!* program. 17 of the 21 scientists were interviewed.

The interviews focused on getting feedback and constructive criticism from both the students and scientists in the *YES!* program. The students were asked questions such as: why they chose to participate; what their expectations were; what they did in the scientific settings; how they interacted with their assigned scientist, the *YES!* staff and the other students; what they learned about themselves; what they liked and disliked about the program; the short-term and long-term benefits of the program; and how they would improve the program.⁸

The scientists interviewed were asked general questions about: how they became involved; what they expected from the program and the students; whether they enjoyed their personal interactions; if they thought the program was meaningful; what issues they faced and how they would solve them; and if they would participate again.

⁶ See Appendix E for the Parent Informed Consent Form.

⁷ See Appendix F for the Parent Packet.

⁸ See Appendix H for the summer 2011 OP&A Interview Guides.

Report Contents

Following this Introduction, the next section presents OP&A's Student Feedback, using the content of the students' interviews and their own words for illustrations. The section begins with an introduction to the students, based on their applications. The Scientist Feedback is similarly constructed. The Conclusions and Observations section includes the OP&A team conclusions as well as conclusions articulated by students and scientists. Observations and OP&A's suggestions for the next iteration of *YES! (2012)* are interspersed with the conclusions.



Student Feedback

Introduction

Selections of students of the 2011 *YES!* program were based on application essays, transcripts and recommendation letters. Because of a lack of time, as in 2010, the students were selected without telephone or personal interviews. NMNH's goal was to choose applicants who showed a personal connection to or expressed interest in science, and who would be lacking in opportunities to pursue science in their community or school. The program also strove for geographic diversity in the Washington Metropolitan Area.

At the beginning of the 2011 *YES!* program, Latino students constituted the majority (11); the others were African American (5), Caucasian (1), and Multi-racial (3) students. There were 7 males and 17 females from Maryland, Virginia, and Washington D.C. Their ages ranged from thirteen (1) to seventeen (1), with the majority of the students between fourteen and sixteen (22). Three of the students in the 2011 *YES!* program were also in the 2010 *YES!* program. Students that listed a grade point average (GPA) had an average GPA of 3.51(8 students wrote N/A).⁹

⁹ See Appendix B for student demographic tables.

Student Interviews

Participation

Some of the students expressed their main reason for participation in the *YES!* program as a genuine enjoyment of science and desire to advance their future goals to become scientists. For example, one female student who loved her internship work said,

"I love science, especially biology, and wanted to learn more about anthropology. Working with the scientists opened up more career interest in science. I have never thought of becoming a [...] but after working with my scientist who works in the [...] department, I love the work there."

Another said,

"Well, my chemistry teacher gave me the link to the [*YES!*] website and I looked at it and I thought it would be cool because I love science and I want to be a genetic engineer and biochemist."

One male student, whose focus was working on his communication skills, as well as science, said,

"... because I want to be a surgeon. So I want to have an experience with people 'cause I am not really a social type person."

Other students had different approaches to the internship and had a variety of other reasons for participating. Certainly, students assume that working at the Smithsonian looks good on a resume:

"Because I want to expand my knowledge of science. And I thought it would be a great opportunity to help me to promote the things to put in my resume for college."

"I wanted to participate because it was a science program associated with the Smithsonian."

A female student, whose friend participated last year, commented,

"... So I applied for it because I was looking for something to do over the summer, because it looked like a really fantastic program and I was very interested in it, and because, to be honest, an internship at the Smithsonian looks really good on a college application."

The students who participated last year all said essentially the same thing: they enjoyed last year, and they returned since they like science.

Expectations

While a few students did not know what to expect, many others had clearly formed expectations. Some students felt that their expectations were met, while others did not. Students whose expectations were met mainly focused on the work involved:

"I expected a lot of work about science. In the brochure, it said the program was associated with the anthropology department so I expected to study about that."

"I thought it was going to be really hard and that we were going to do lots of things and learn lots of new things."

"I thought it was going to be more physics, labs and experiments but it's more like an assistant to a scientist."

"I expected more like a classroom...There was some classroom but not as much as I thought"

Many of the students whose expectations were not met said that the program going beyond their expectations was positive:

"I thought it was going to be more 'intern work' but we actually get to do fun things like going to different museums or doing different activities. That's really fun. I thought we would spend more time on the project even though we did spend some time on the project. I thought intern work wouldn't be really glamorous - like writing and scanning files - but actually I got to draw things from the microscope and that's really cool."

"When I first entered the program, I thought that all I would do is work with my scientists all day for six weeks and learn about college...I didn't expect much. After I came here and experienced it, it was way more than I expected. I had *RACE* training, tours, and public interactions. I liked the public interactions because I could talk to really interesting people and discuss an exhibit with them."

"I expected the program to be like science classes in school, like chemistry and biology. I expected more lab classes rather than communication classes and *RACE* training. ... I'm glad that I could get something other than what I could get from school."

A student who expected more behind-the-scenes museum tours said,

"I didn't know we were doing the Zoo in the beginning, and I think that was my favorite part of the whole program. I'm not really that thrilled about the history, coming here in the museum. I feel we aren't doing much, like, we're not really learning much about science as we're learning about race and stuff like that and communication."

Overall, the students seemed to either have their expectations met or exceeded by the program. Only a few students seemed unenthusiastic or unhappy in their comments.

Projects

Some students wished that they could choose their science projects because they would be more comfortable that way. One girl expressed a general concern as well as a concern about her fellow students:

"Make sure that where you are placing students is where they want to be and make sure they are comfortable. ... they weren't really placed where they wanted to be. Some people were placed at an Insect Zoo but they don't like insects at all. So, they should probably get to know more about students' interests and place them in a place that they know they could be comfortable."

A few students initially did not understand why they were assigned certain projects that were repetitive or that they viewed as 'unnecessary.' However, they admitted that as the summer progressed they realized that they were involved in a scientific process that involved repetition and some tedium.

"With my mentor, I wasn't sure what they really had planned for me. But then once I started... like the first step was... I work with entomology, so I work with insects. And at first she just had me sort some insects from out of a dish, and I thought I'd be doing that for the whole time. But then, once I was done with that, I moved on to the second step, which was mounting them, drying them out. So then I realized that I was doing what they do on a daily basis and that when I was done with the mounting, I'd do other things and just in a series of what they do."

On the whole, the students seemed content with their projects and a few really professed to love their assignments.

"I like the projects too. I never knew there were scientists behind the museums. I love this program."

"Well, my project is in the small mammal house in the zoo. I totally love it."

"My favorite part is my project."

Interactions with Staff and Peers

The students discussed their interactions with the scientists, the *YES!* staff, and the other students. The students did not offer any negative comments about any of the scientists they worked with; most students really enjoyed working with their mentor:

"My scientist was really cool.... He was a really good mentor."

"It's pretty fine. We joke around and talk. "

"He was very professional. And we did talk about different topics, not only about the animal. He gave advice about going to college or about my future."

"It was really good. My mentor is really cool. I really like her; she's really nice. She's taught me a lot, so that was good."

"Just excellent. They're all nice and I can ask them anything. If something seemed too tedious, I can tell them and they'll give me something else to do. So very helpful."

The NMNH education staff also received overall positive comments. The 2011 *YES!* Program Coordinator and Program Coordinator's Assistant were frequently mentioned as helping create a positive experience for the students. Similarly, CMAST staff was also mentioned in a positive tone. The only slightly negative comment was that the staff could sometimes be strict (but in a way that was respected).

"I like the guy who talks about public speaking and stuff like that. I like him the most."

"It was good. [2011 *YES!* Program Coordinator] and [2011 *YES!* Program Coordinator's Assistant] are really cool."

"My relationship with [2011 *YES!* Program Coordinator and Program Coordinator's Assistant] is more like with friends."

"[The 2011 *YES!* Program Coordinator and Program Coordinator's Assistant] are very nice and funny. They are fun but strict too."

The students' relationships with each other were mostly positive. The majority of the students felt that everyone got along fine and that after a short period of getting to know each other, everyone became friends. Only two students seemed to have any problems; however, both said they were okay with not being friendly with everyone. The students who participated together last year consider themselves a special group. The students at the Zoo, by virtue of spending more time together, were also closer. One student said that working at the Zoo made her feel isolated from the rest of *YES!* participants.

Students that had a partner in their laboratory enjoyed having one. The majority of those that did not have a partner indicated that they would not object to having one. Only one student stated that she enjoyed working alone, because "...you get more of your mentor's attention and time." One enthusiastic student said,

"I made really good friends from this program. People in this program are really nice. I can't wait until fall to meet these people again. I might even cry when I finish this program."

Self Evaluation and Benefits

Many students reported having better communication skills as a result of the *YES!* program. Others said that they discovered they enjoyed science more than they thought. On the other hand, one student learned that she would not enjoy doing research for a living, while another learned that she would enjoy an office job as

compared to a laboratory. The program also helped many students overcome fears of dissection, dead animals, and bugs.

"I learned that I actually do have a fear of bugs. This program made me overcome that. And I am able to communicate with the public."

"I learned how to socialize with people, how to tell them about science."

"I learned that I really like science. I thought I would be scared of dissection but it was fun."

"I learned that I was not as shy as I thought I was. During public interactions I would go to people and ask questions and not be scared."

Benefits (Short term and Long term)

Some students mentioned that the short-term benefit is getting out of the house, where they would be doing nothing anyway; others mentioned getting paid as the short term benefit:

"Short-term benefits, you get twenty-five hundred bucks. Sorry, that was a little bit coarse. I gladly would have done this for free, like volunteering."

"Short term you get to experience something other people can't do. And also as a paid intern."

Other students saw different short term benefits that were more linked to *YES!* goals:

"It all depends on where they [students] work, what their project is. I've definitely gotten better at public speaking, so that's one thing, if you're shy or nervous or whatever, you learn about that."

"... you get to work in the Smithsonian."

"A major short-term benefits for the students is that they get an internship experience. Most 14, 15 year olds do not have the experiences for internships."

As expected, the long term benefits mentioned mostly frequently included college or future careers. Getting to meet new people and learning about science were also noted. However, without question, most cited putting the internship on their college resumes and networking with the Smithsonian as a critical long-term benefit.

Assessment of *YES!*

On the whole, the students enjoyed the different components of *YES!* including public speaking (CMAST) and cross-cultural communication (*RACE* training), working with their mentor, and behind-the-scenes tours (e.g, to the Museum Support Center, Smithsonian Conservation Biology Institute in Front Royal, VA, and Smithsonian Environmental Research Center in Edgewater, MD.) A few students had specific

comments. Specific area of criticism included the requirement to have lunch at NMNH daily, the *RACE* training and the orientation.

Some believed the *RACE* training and some of the other sessions need to be organized better.

"Some *RACE* training classes were a little unorganized, but other than that everything was pretty fine."

"At first, everything was kind of... It wasn't as organized as I thought it would have been. But then one week in or something like that, everything became clearer and I understood more things than I did before."

"Well, one day the guy wasn't there and his little assistant guy came and he did this game and it didn't really work out, and it was kind of halfway there."

A few students were interested in having lunch elsewhere.

"It would be nice if we could go out for lunch. Museum food is great but I have to eat there every day. Other than that, I love everything here!"

"I think they need to allow us to go out for lunch not in the Museum."

RACE training was widely commented on in both a negative and positive light by the students.

"I didn't know we were doing the zoo in the beginning, and I think that was my favorite part of the whole program. I'm not really that thrilled about the history, coming here in the museum. I feel we aren't doing much, like, we're not really learning much about science as we're learning about race and stuff like that and communication."

"*RACE* training is definitely interesting. CMAST is really cool."

"*RACE* [training] I think is a waste of time. Yeah, when I think of going to the history museum and seeing behind-the-scenes, we would be actually working with some of the bones and stuff like that and not just getting tours of it. I know the Museum can only allow so much and all that kind of stuff, but the *RACE*, it's trying to teach you that there's no such thing as race, but I think that if somebody... If I was racist, and I'm not, but if I was and I went to these talks, they would not persuade me to change my mind. I just think there could have been something else we could have done that would have been a better use of our time."

"I really liked the *RACE* training sessions. I think it's interesting."

"I really didn't see the whole point of the *RACE* training because some people didn't even have to go to the *RACE* exhibit. I guess it was just for learning experience?"

"The *RACE* training was really interesting, like the topic in itself is very narrow and specific. Most of it was interesting, like learning about race in different ways. It was good."

"Classes could be a little different. Exhibition training should not be based on just one exhibition like only *RACE* training. I like the communication trainings and find them useful. I think we should cover exhibition training in general and basics because we need those skills since we are having public interaction classes in different exhibitions."

A few students mentioned Orientation and the beginning of the program.

"We weren't really doing anything, just kind of sitting around and listening to the same speech basically."

"When we first started the program, we didn't do many things because of orientation. If I was in the program, I might have more activities than orientation."

There was mention that too many students were focused mostly on getting the stipend and that they should not be able to participate if that was their purpose.

In the words of one student,

"...most of them are focused on the stipend. I mean, the money is nice, but it's not a necessity. There are some people in this program that would do it for free, and I think those are more like the people who should be in the program, not the ones who just want the money and that's their only concern."

"The one thing that I want to say is that with the payment, some people were just anxious about getting paid."

Some students mentioned that there needs to be more tours, but most seemed satisfied.

"My favorite tour was a trip to the Museum Support Center."

"Last year, we did tours of the mummy vault and tours of the paleo lab."

"Some of the tours were boring."

"I liked all the tours because we got to go where other people don't get to go."

"Maybe, since we have different tours, like yesterday, there could be more tours for other things that we haven't done yet, that I know most of us want to do. Or just to see."

Some students mentioned that interviews should be conducted to select the *YES!* students to ensure that they are interested in science and to assign them to projects that fit their interests.

"[The 2010 *YES!* Program Coordinator] mentioned that you guys were going to have interviews for the next batch of *YES!* interns and I agree with that, because I don't think that some of the people are here for the right reasons, necessarily."

"I guess I would let them have an interview before they assign the project. And to measure people up to see what place they would be best suited, because we [were] just assigned randomly."

Schedule and Program Length¹⁰

The program schedule worked well for most of the students.

"I liked the layout, the schedule of the program. You'd go with your mentor, then have lunch, and then we'd have the separate classes, like *RACE* training and CMAST."

About half of the students said that the overall length of *YES!* was enough. The other half wanted more time and felt that the program should continue all summer with no break before the fall program.

"Yes [six weeks are enough]. It actually went really fast because it takes a while for the first couple weeks to get into a daily schedule and be able to meet people. If it was shorter, you wouldn't have enough time to get to know other people."

"Make it longer. I would definitely make it longer. The summer part [should be] longer... I go back to school in September and I have nothing between the sixth or seventh and the seventh of September. I have nothing in between there."

"I think the program being six weeks is definitely enough time because scanning all those files and doing all those drawings took a lot of time. I was definitely able to get them done through the six weeks period."

"I feel like it is short."

They also asked for more time at the zoo.

"When I was at the Zoo, I didn't have enough time to spend with our mentors. We had to leave early. I wish that I had more time at the Zoo."

¹⁰ See Appendix G for a detailed calendar. An abbreviated calendar is in the Parent Packet (Appendix F).



Scientist Feedback

Introduction

The scientists in the *YES!* program are all volunteers who gave their time to mentor these students. There was no screening for the staff; however, there was a session on mentoring. This session was meant to help the staff become comfortable with working with the students, but many of the scientists did not go or were unaware that this session was offered. Six of the scientists also participated in the program in 2010.¹¹

Participation

Many of the scientists were recruited by word-of-mouth because someone mentioned the program to them especially, either the *YES!* Program Coordinator or a co-worker. Another reason they got involved is because they had projects available that interns can do. One scientist said that he was recommended for the program by a colleague at the Zoo. A few scientists specifically stated reasons involving mentoring students as to why they became involved.

"I thought it was interesting. Also, I have an opinion that the sooner people get exposed, [the sooner] they are capable of making decisions."

"I started at the Zoo as a volunteer so I want to give somebody a chance to come in and give it a shot. I just said 'yes' right away."

"One of the things that I like about this program is being able to interact with students."

¹¹ See Appendix D for the 2011 Guide for Scientists.

Expectations

Many of the scientists did not expect the level of maturity many of the students showed; only a few scientists expected maturity from the students. A few scientists also stated that they expected their student to be an underprivileged minority student lacking direction, instead of a student already sure and preparing for college. The scientists also expected the students to have an interest in the science they are involved in.

"I expected a young kid."

"I was expecting an underprivileged minority student who didn't have a lot of direction. It turned out to be a little bit different which was fine. My student already knew what she wanted to do and planned on going to college."

Interactions

Most of the scientists enjoyed their time with their student, with only a few negative moments like issues with motivation and attendance. However, this cleared up soon because as one scientist mentioned, the program was run with an iron fist this year.

"She was on time, in fact, ahead of time. [She] is very good illustrator. She is an artist. She had one of her drawings on the poster."

"Initially, there were fits and starts. [She] was less than ideally motivated. I had a talk with [the YES! Program Coordinator] and it was a turn-around."

"He was a good, smart, bright, and sharp kid but I don't think it was his calling."

"The two interns that I mentored were fabulous."

Some scientist professed they would have liked an introductory session about who the students in the YES! program were and exactly what the program goals were in teaching these students. Some scientists mentioned that this year's students were not very excited.

"It was a rough start with them. They weren't eager to be the part of the program when they started."

There was a mentoring session available to help make the scientists more comfortable with mentoring their students, however, many were either unaware of the session or chose not to go.

"No, I didn't know there was a training session."

"I personally would have liked more preparation because it is my first year. They did have one meeting but it was right before the program."

"I found it more descriptive of the program and what was planned for the students." [This scientist would have liked more about mentoring.]

One scientist who chose not to go said,

"We got some paper for the mentoring program. We have an idea of what mentoring is. We mentored high school kids about a research project."

Meaningful

Many of the scientists believe programs such as the *YES!* program are necessary and meaningful and many would participate again. Outreach is a word used to describe what the scientists seem to believe is important in making the program meaningful.

"I think outreach programs are important and clearly science literacy is very low in our country and as a paleontologist we have not engaged the public enough. I do feel really strongly that we need to do more and I think that programs that target underrepresented kids...I think that too, when people said their science is not amenable for kids to work with me... I don't believe that, it's a little bit of a copout... nothing? I understand their point, but never? I don't believe that."

"Personally, outreaching is important to me so it was fulfilling but frustrating too."

Issues and Improvements

The scientists had suggestions about improving the program specifically in the areas of the students' posters, length and schedule, recruitment and outreach, and communication.

The poster, assigned by the *YES!* program as a requirement, was a topic that was either neutral or frustrating for the scientists. Some mentioned that having the students create a poster on what they are working on may not be the best idea and that the scientists should have more input into the poster.

"I can't imagine [him] just talking about data basing. I didn't even see the poster."

"That was the most unclear thing about the program. I found out that there was a project poster due on the last week of the program."

One scientist believed the posters should be more in-depth.

"The poster is pretty much saying what they learned. I saw the poster and I think they were given a template and have three areas to address. I wouldn't say it is an elaborate poster."

"I would have been happier if we could address a question [in the poster]."

The length of the program, while perfect for some scientists, was deficient for others. There was a discussion with some of the scientists about scheduling the program next

year as two or three full days in the laboratory. The scientists were divided about this approach, with more leaning towards a negative perspective. Those opposed to full days thought that full days were too long, that the interns would be bored, and that the scientists are too busy to devote full days. The reasons in support of this suggestion include that there would be more time to teach the interns and finish projects, the intern would not be bored, and the mentors would then have two days for themselves.

"I think the program hour was too short. If he gets a project, he could not finish before 11:00am."

"It worked out well... For the project that these two students were working on, I think three hours is a maximum. It would get tedious."

The staff at NZP, especially, had problems with length and scheduling. They have schedules to keep to for animal feedings; their students did not get as much time as the others because they had to travel more.

"Programmatically, there were some problems with how the time frame at the zoo was given for these kids. The time frame of their work at the zoo was too short in terms of getting a feeling of what it is to be in this profession. It takes time to train and use these practical skills under supervision. Mainly, our intern spent a lot of time shadowing us, watching what we did. Because of the short time frame, she didn't achieve the goals that I wanted her to achieve. I felt that some of it was [due to] the program limiting on the Zoo side and some of it was [due to] her."

The recruitment and outreach of participants was a major discussion issue among the scientists. The most frequently mentioned idea was the need for in- person or phone interviews.

"I see the interview process as a gauge for whether the student is really interested or [whether] the parent is pushing that student: 'Hey this is a really good thing that's going to get you into college.' Then we could see if the student is truly the one who's motivated to do this project and I think that is the benefit of interviewing."

"I think part of that could happen through an in-person interview process. I participated in scoring many of the applications this year. I think the application needs tweaking as well in the essay questions, which were very broad. What they wrote almost meant nothing in many ways. You need to read between the lines to get anything out of the essay questions."

The scientists also mentioned that their understanding was that the *YES!* program was meant for underprivileged minorities and the composition did not reflect that criterion. Two scientists said that where the kids came from did not really matter to them, while two other scientists were very passionate about the topic of only recruiting underprivileged kids.

"[If] that's what you want your program to be, it should be. We have a waiting list of volunteers. I thought we were doing a good thing reaching out to community but it didn't happen."

"I think these two positions went to students who already have the access to these experiences elsewhere. This position could have gone to more underprivileged students given the nature of the *YES!* program and the funding sources and the criteria that were used to make selections."

NZP wants to put the *YES!* program on its website to recruit more zoo-interested students. It was also mentioned that many of the students who sent in applications were more interested in medical fields than natural science. Overall, the scientists felt that recruitment needed a lot of refinement and needed to have clearer goals.

Communication was the last area mentioned that needed major improvement. Scientists said that communication was problematic during most of the program. Many scientists professed being unaware that the students had to make a poster and one scientist suggested that the mentors attend the parent session so they are up to date on the program requirements. There were also problems with communication to the Zoo staff. However, some of these problems will be alleviated as the NZP program goes into a second year.

A scientist at the zoo said,

"My boss told me that she will allow me next year to solely focus on the *YES!* program for six weeks. If the funding is available through our education department, I'll try to get another coordinator who will assist [the *YES!* Program Coordinator] on our end."

One scientist seemed not to have a schedule.

"Also, a clear schedule should be handed out before the program starts." While another scientist found his schedule helpful. "It seemed to me that it was a well organized program and I had this schedule so I could keep track of the student."

"The only thing that I would want to change is communication. I got the dates for my intern's first and last day. A few days before her last day, I found out that her presentation was the day after her last day. But, I had already scheduled vacation time so I missed her presentation. I was very disappointed. I would have wanted to know in advance when the presentation is going to be. Also, she left the Zoo at different times because she had different things going on. I would have liked to have known that more clearly because I asked my intern every day. It was hard for me to get a sense of what her schedule was. She told me that she needs to leave at 11:30 and she was late every day to Natural History, but we didn't know that."

Involvement Next Year (2012)

Most of the scientists were positive about participation next year. There were some scientists who said they wanted to come back, but only if the program had some restructuring done and some improvements made. When asked if the scientists would feel comfortable having two interns, the answers were about half and half.

"Probably not. I would feel like babysitting."

"My intern cost some time so I think it should be two different keepers for two interns."

"I would have taken two this year."

"I think taking two, especially in the beginning, they will feel more comfortable."



Conclusions and Observations

In order for the *YES!* program to expand and reach its full potential there are aspects that need to be addressed. By looking at the feedback from both students and scientists, several areas of concern for both are identified. Both the students and the scientists feel that a better system of matching students and scientists needs to be developed. In addition, the schedule needs to be refined and adjusted. Students and scientists who participated both in 2010 and 2011 *YES!* programs consistently commented on the improvements noticed in 2011. Both students and scientists viewed *YES!* as beneficial. Most of the students said they would recommend this program to others and the scientists felt they would participate again in the future. Overall conclusions and observations are elaborated below.

The major goals of the *YES!* program still remain somewhat unclear to some students. 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; and prepare a PowerPoint presentation about their activities. (In the fall, they will attend courses that provide information on universities and colleges and the financial services available to them.) While much improved over the 2010 schedule, the tug-and-pull of the resulting schedule sent conflicting signals to the students about the overall primacy of science compared to other activities.

It may be appropriate to schedule discussions with the students about the overarching goals. One opportunity would be to discuss them at the initial Open House, in the presence of parents. However, *YES!* needs to prioritize its ambitious goals and tailor activities and time allocation accordingly.

From the perspective of the scientists, many were expecting lower income, underserved Latino students. They expressed disappointment that some students were not of Latino origin and that most were from middle class backgrounds. Again, some discussion before the program may be appropriate.

Selection Process: Students. As was the case in 2010, the majority were rising sophomores or juniors who, due to lack of time, were accepted without interviews. Applicants were supposed to be 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, some had no interest in the program, were in the program merely to add an item to their resume, to collect the stipend, had no other alternative activities for the summer, etc. The majority were middle-class students who probably will go to college with or without participation in *YES!* or further encouragement. Three of the 2011 students had been in the program in 2010. We suggest several possible changes: First, conduct visits/discussions with DCPS to identify schools/classrooms with potential participants and have them visit NMNH prior to acceptance. Second, recruit several students from the same school, which may encourage the target population to apply. There is evidence to suggest that some of the cultural barriers may be eased with 'team' recruiting. Third, require personal or phone interviews prior to acceptance. Finally, design a more structured application form that gives students choices of research areas and/or working environments. For example, they could be asked to select two items from a list that includes working with live animals at the Zoo, participating with gardeners to care for live plant collections, working with botanical specimens, working with insect specimens, etc.

Selection Process: Scientists. In 2010, it became evident that many of the scientists had no experience with young students and many were pushed into accepting them. The training sessions offered to scientists in the 2011 *YES!* program were very helpful to the few that attended them. In 2011, the program considered a broader definition of staff to supervise *YES!* students, i.e., working with animal keepers at the National Zoological Park (NZIP). Many were individuals who acted not only as supervisors for the students, but also as mentors. In comparison with 2010, interviews suggest that 2011 science staff participants included more people-oriented personalities. Of those we interviewed, many expressed an interest in repeating the experience. There is still the issue for each science staff participant of how to best serve the students needs while ensuring that their primary work does not suffer due to involvement in the *YES!* program.

Schedule. The 2011 *YES!* schedule for the students essentially had them work with the scientists in the morning and participate in other activities in the afternoon. For the students at NZP, this schedule was challenging. First, they lost valuable time making the trip from NZP to NMNH on the Mall for the afternoon session. For some, this involved a 20-minute walk from their work place at NZP to the meeting place from which students returned to the Mall. More critically, the rhythm of activities at the zoo meant that the students were exposed to a limited set of activities; i.e., mainly cleaning and feeding in the morning. They missed, in many cases, other interesting aspects of animal care such as training in the afternoons. We would like to suggest that NZP interns have a different schedule than those on the Mall. One possible scenario, suggested by a scientist, would be to have students for three full days at NZP. This could include some educational activities working with visitors at NZP, as well. The other two days would be on the Mall.

Projects. Students in both years were not aware that they would be assigned research projects rather than having choices. In sharp contrast to the 2010 *YES!* program, the tasks that were involved with the students' projects this summer seemed more in keeping with the educational aspects of the program. Few were given tasks that included scanning papers or performing other less hands-on tasks. The repetitive and monotonous aspects of laboratory science were communicated to some – with mixed results. Many students again expressed a desire to have the ability to choose their projects in order to engage more of their personal interests. This leads to the suggestion that science staff supervisors clearly define projects or activities. The students appreciated the final PowerPoint presentation; however, in some cases it came as a surprise to the scientists. We would suggest that while the students work on a PowerPoint presentation in the 'non laboratory' time or on their own, the scientists should have the opportunity to review and approve the presentation for scientific accuracy.

Partnerships. Partnerships, i.e. dual assignments of two students to one supervisor, were a topic of discussion among the students in the 2010 *YES!* program. The majority was in favor of working with a partner, as they thought that it would enrich the experience. The increased use of partnerships in the 2011 *YES!* program was well received by both scientists and students and might be expanded.

Length. In 2010, both students and scientists expressed interest in a longer program, either hours/day or weeks/summer. In the 2011 *YES!* program, more time was allocated to working with the scientists; this was appreciated by them. However, as noted, time was lost at NZP.

Attendance and Pay. In sharp contrast to the first year of *YES!*, few students had significant absences during the program. The *YES!* staff's emphasis with students and

parents on attendance reduced missed sessions and increased commitment. In the course of the program, personal reasons led to one student dropping out and another being reprimanded. Students were aware that the \$2,500 they received for six weeks was much more than most SI college-age interns receive.

Staffing. Students and scientists all praised the one full-time staff Program Coordinator assigned to the program and his intern. However, with the program growth and students at NZP and (proposed) in the Smithsonian Gardens for 2012, additional staff might join the team in order to divide duties. It is clear that one scientist became a *de facto* liaison between NZP and the Mall program; however, this role should be formalized. An Education Specialist to assist in curriculum development and implementation of daily intern activities might still be appropriate.

Summary. The changes made to the 2010 *YES!* program after its inaugural year appeared to be effective in the 2011 *YES!* program. At the same time, there is much to be learned from the 2011 experience so that the program can grow and improve.

Appendix A: 2011 YES! Program Project List

| Department | Contact(s) | Title | Project Description | YES! Intern(s) |
|-------------------|----------------------------------|---|--|-------------------|
| Botany | Ida Lopez | Botanist | Zingiberales Project | |
| | | | <p>Technological advances now allow botanists to help identify plant species using DNA. Besides the classic botanical pressed-specimen collection methods, botanists now collect tissue samples for use in DNA studies. This new method of collecting has undergone various forms of archival storage. The two internships will focus in adapting the present collections into a standardized, more modern and more compact archival system. Work will be performed in the NMNH Botany Department.</p> <p>(student poster attached)</p> | 2 |
| Entomology | Terry Erwin | Entomologist- Chair of Entomology | Coleoptera Unit-Systematics | |
| | Gary Hevel; Charyn Micheli | Research Entomologists | <p>The intern will be introduced to the fascinating and vital world of systematics on the professional assistance level. Assistance will include pinning and labeling specimens which is important to the success of the operation and enhancement of the National Entomological Collections, especially in the Coleoptera (beetle) unit. Other associated work might include such tasks as data-gathering and reference searches in entomological publications.</p> | 1 |

| | | | | |
|-------------------|---------------|---|--|---|
| | John Brown | Research Entomologist | Lepidoptera Microscope Slide Collection | |
| | | | Associated with the Lepidoptera (butterflies and moths) collection at the National Museum are over 120,000 microscope slides of wings, genitalia, and other morphological features. The goal of this project is to compile a database of the slide collection that can be queried to answer a variety of questions. The primary tasks are transcribing data from laboratory notebooks and from the slide collection into an Excel spreadsheet, amalgamating a data from a variety of different sources, and producing an accurate inventory of the slide collection. [The project is already in progress, and the intern will be one of several contributors.] | 1 |
| | Shelah Morita | Fellow, Research Collaborator, Entomology | African Insect Diversity | |
| | | | The intern will help sort insect collections from Kenya to order and hopefully family level. She will then analyze the distribution of insect diversity across the trap sites examined from varying habitat types. Emphasis will be in Diptera and Hymenoptera. | 1 |
| Insect Zoo | Dan Babbitt | Museum Specialist | Insect Zoo & Butterfly Pavilion | |

| | | | | |
|-----------------------------|-------------------|------------------------------------|---|---|
| | | | This hands-on internship will give the interns the unique opportunity to support the Insect Zoo & Butterfly Pavilion staff in many aspects of the exhibit's daily operations. The interns will assist with plant care and animal husbandry in the lab and exhibit, interact with museum visitors, maintain clean conditions in the exhibits and lab and work with staff to ensure butterfly containment. | 2 |
| Invertebrate Zoology | Kristian Fauchild | Research Zoologist | Polychaete Worm Project | |
| | | | The intern 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. The intern will concentrate on a selected family or group of species and create a comprehensive online library for the taxa selected. | 1 |
| Libraries | Ann Juneau | Head, Smithsonian Libraries - NMNH | Biodiversity Heritage Video Project | |
| | | | In the Libraries, we have content and our own quality control. Ann will work with the intern to select a number of GIFs or JPGs from each website to tell a story in a video, labels to go with the images and then string together in a YouTube video. Her experience will help create the files of images. Using a movie maker type program, the intern will pull together a video of such images with music that could be posted to YouTube. | 1 |


| | | | | |
|--------------------------------|-----------------|---------------------------|--|---|
| Mammals | Suzanne Peurach | Vertebrate Zoology | Mammal Collection Organization | |
| | | | <p>The interns will assist with the organization of a collection of mammal skins and skulls that we recently received. Skins will be organized by basic group (shrews, mice, squirrels, bats, rabbits, etc.) and then sorted by specimen number onto new specimen trays. Skulls will be matched with skins, using guides to help differentiate types of mammals. Once the collection is sorted and skins and skulls are matched, we will catalog specimens that are chosen as good additions to our present specimens' holdings.</p> <p>(student poster attached)</p> | 2 |
| National Zoo-Amazonia | Justin Graves | Animal Keeper, Amazonia | Amazonia-Keeper Aid | |
| | | | <p>The intern will become an Animal Keeper Aide at the National Zoological Park. This hands-on program will engage her to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The intern will also help keepers with various other projects around the exhibits assigned to him.</p> | 1 |
| National Zoo-Asia Trail | Juan Rodriguez | Animal Keeper, Asia Trail | Asia Trail-Keeper Aid | |

| | | | | |
|--|------------------|-------------------------------|--|---|
| | | | The intern will become an Animal Keeper Aide at the National Zoological Park. This hands-on program will engage her to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The intern will also help keepers with various other projects around the exhibits assigned to her. | 1 |
| National Zoo-Bird House | Gwendolyn Cooper | Animal Keeper, Bird House | Bird House-Keeper Aid | |
| | | | The interns will become Animal Keeper Aides at the National Zoological Park. This hands-on program will engage the interns to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The interns will also help keepers with various other projects around the exhibits assigned to them. (student poster attached) | 2 |
| National Zoo-Lions & Tigers | Kristen Clark | Animal Keeper, Lions & Tigers | Lions & Tigers-Keeper Aid | |
| | | | The interns will become Animal Keeper Aides at the National Zoological Park. This hands-on program will engage the interns to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The interns will also help keepers with various other projects around the exhibits assigned to them. | 2 |
| National Zoo-Reptiles | Richard Quintero | Animal Keeper, Reptiles | Reptiles-Keeper Aid | |


| | | | | |
|-----------------------------------|------------------|----------------------------------|--|---|
| | | | The intern will become an Animal Keeper Aide at the National Zoological Park. This hands-on program will engage her to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The intern will also help keepers with various other projects around the exhibits assigned to her. | 1 |
| National Zoo-Small Mammals | Rebecca Smithson | Animal Keeper, Small Mammals | Small Mammals-Keeper Aid | |
| | | | The intern will become an Animal Keeper Aide at the National Zoological Park. This hands-on program will engage the intern to assist in food preparation, cleaning, assisting keepers with enrichment preparation and behavior watches. The intern will also help keepers with various other projects around the exhibits assigned to her. | 1 |
| Paleo-biology | Bill DiMichele | Research Geologist, Paleobiology | Fossil Plants "Seeing" is one of the most challenging parts of observational science and is a skill that scientists learn and hone over time. In this project, the intern will be given a suite of four specimens to examine, one for each of four weekly visits. For each specimen, she will draw what she "sees" freehand, with a camera-lucida microscope, and via various kinds of computer assisted photography. Readings on fossil plants also will be provided. At the end of the project, the intern will be able to compare and contrast how the material looked to her at first with how it looks after a month of repeated study. | 1 |

| | | | | |
|----------------------|----------------------------|----------------------------------|--|---|
| | Conrad Labandeira | Research Associate, Paleobiology | The Permian Expansion of Herbivory in Euramerica: the Colwell Creek Pond Deposit in north-central Texas | 2 |
| | | | This project seeks to understand the levels of intensity and diversity of plant-insect associations in an Early Permian (Kungurian) site that records one of the earliest records of herbivory outside of the Late Paleozoic swamp floras. This deposit contains a unique flora of plant hosts—gigantopterid, medullosan and peltasperm seed ferns, conifers, ferns, cycadophytes, and calamites—that contain a distinctive spectrum of insect damage types. Preliminary observational evidence indicates that many insect herbivores had high levels of host-plant taxon specificity as well as the targeting of particular tissues of the three-dimensionally preserved leaves and seeds of this plant assemblage. The two students will work on specimens showing these features of fossil insect herbivory. | |
| Paleo-biology | Abby Telfer, Jocelyn Sessa | Museum Specialist, Paleobiology | Fossil Mollusks The interns will participate in a hands-on research experience focused on discovering how the body size of mollusks (clams and snails) changed during twenty million years of evolution. Fossil mollusks previously collected from the US east coast will be used to understand how prehistoric communities responded to climate change and how they recovered from the meteorite impact that killed off the dinosaurs. This event caused a catastrophic disturbance in the world's oceans and the extinction of an estimated 75% of molluscan species. Several shifts in climate follow this mass extinction, including both long and short periods of global warming. The interns will sieve and wash samples to obtain fossils and then measure these fossils using digital calipers to create a dataset of body size through time. They will also use a dental drill on low speed to obtain powdered shell samples, which I (Jocelyn Sessa) will then analyze at the MSC stable isotopic lab. Paleotemperature | 1 |

| | | | |
|--|--|--|---|
| | | | will then be determined from these isotopic analyses. Multiple time intervals will be studied, ranging from the first few million years after the mass extinction, to an interval of rapid global warming at 55 million years ago, to twenty million years after the mass extinction. Following data collection, they will analyze body size in relation to time elapsed since the mass extinction and to the temperature data they collected, and create presentations describing the results of their research. |
|--|--|--|---|



Zingiberales Project



Project Description

Technological advances now allow botanists to help identify plant species using DNA. Besides the classic botanical pressed specimen collection methods, botanists now collect tissue samples for use in DNA studies. This new method of collecting has undergone various forms of archival storage, including storage in airtight plastic centrifuge tubes and easily storable plastic bags. Our internship focused in adapting the present collections, which included exotic plants from all over the world, into a standardized, more modern and more compact archival system. We worked in the NMNH Botany Department.


What We Did

In this internship, we worked in the national herbarium transferring present collections of plant tissues into a more modern archival system. This system was comprised of acid-free coin envelopes, rather than the more space-consuming large plastic centrifuge tubes shown in the picture on the top left. We sorted, labeled and organized plant tissues. While working on this project we were able to work around botanists and botany interns and observe their work on a daily basis.


What We Learned

Alexandra: "This internship was an amazing opportunity for me. I learned how to carefully handle plant specimens using tools like forceps, how to use Excel, and most of all, what life is really like in the scientific workplace. I learned that most work done by interns will not be the fancy stuff in a lab – you have to work your way up to do that. Additionally, I discovered that the lab reports that I do in my science classes at school actually mean something: when scientists present their research and progress to one another in a meeting, they use almost the exact same format as my classmates and I do at school. I handled much more responsibility than I was used to and I got a glimpse of what everyday life for a working adult was like. My experience in the Botany Department reinforced my desire to go into science and, although I now know that performing scientific research is not the field I want to pursue, I still definitely want to go into science, particularly medicine. My internship with the YES! Program not only will aid me on the path through college and into a science career, but also has given me the chance to experience firsthand what life as a scientist is really like."

Carolina: "My experience with the YES! Program has helped me understand science in a whole new way. Before this program I was unsure what I wanted to study, I had so many different interests and I did not have a clear understanding of what each one entailed. Through this program I not only began to understand what it is like to work everyday, but I gained a higher understanding of science and, through listening through real entomologists, anthropologists, zoo keepers etc., I learned what it really means to choose each of those careers. In addition to learning some of the rudimentary skills of handling plants, I have gained an appreciation of botany."



Clockwise:
Calathea burleriana, *Canna indica*, *Alpinia blepharocalyx*, *Costus spectabilis*, *Heliconia bihai*, *Orchidantha siamensis*, *Ravenala sp.*, *Musa laterita*



The Zingiberales

Acknowledgements

Thanks to Ida Lopez, Elio Cruz, Amissa Jablonaki, the Botany Department, W. John Kress and NMNH. Pictures taken from the United States Botanical Research Greenhouses (BRG).

Working Hard in the Lab!

This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center and a generous donation from the MARPAT Foundation.

Keeper Aide - Asia Trail

B. Banneker SHS, Grade 10, Washington DC
Juan Rodriguez, National Zoological Park



Project Description

I was an Animal Keeper Aide at the National Zoological Park. This hands-on program allowed me to assist in food preparation, cleaning, assist keepers with enrichment preparation and engage in behavior watches. I also helped keepers with various other projects around the exhibits assigned to me.



Cleaning the giant panda indoor stall



The sloth bear, Hana, plays with enrichment I created for her

What I Learned

I learned that the true mission of the National Zoological Park is to provide animal care, scientific research, education through public outreach and sustainability. I also learned about the Species Survival Plan (SSP), which manages and conserves threatened and endangered animal species. I learned about the behaviors of the animals I worked with. I also got personal insight into what the National Zoological Park's staff do from day to day. With this amazing experience in mind, I am considering biology and zoology for my potential college career.



The giant panda, Tian Tian, eats a carrot.

What I Did

During my time at the National Zoological Park, I worked with the animals on the Asia Trail. I assisted in food preparation which included measuring kibble and fruit for the sloth bear's diet, measuring bamboo for the giant and red pandas' diets, and measuring cat food and smell for the small clawed otter's and the fishing cat's diets. I also cleaned the sloth bear's and giant panda's indoor stalls and outdoor fields. In addition, I created indoor enrichment for the sloth bears using fire hoses, boxes and boomer balls. Enrichment is very important for all the zoo animals because it stimulates their natural instincts. I also participated in pregnancy/pseudo-pregnancy behavior watches of Mei Xiang, the female mating giant panda. Furthermore, I practiced training with the sloth bears and otters. Training is vital because the animals need to be comfortable with showing body parts for medical practices.



The red panda, Shama, eats grapes on a feeding stick



The sloth bear, Khali, gets trained

Acknowledgements

I would like to thank all of the wonderful staff on the Asia Trail and a special thanks to my mentor, Juan Rodriguez, for showing me the ropes. I would also like to thank the National Zoological Park and the National Museum of Natural History for making this experience possible.



This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center and a generous donation from the MARPAT Foundation.


Smithsonian
National Museum of Natural History

Mammal Collection Organization


_____ The Bullis School, Grade 9, Boyds, Maryland
_____ Langley SHS, Grade 9, Vienna VA
Suzanne Peurach, USGS/National Museum of Natural History

Project Description

We assisted with the organization of a collection of mammal skins and skulls that were recently received. Skins were organized by basic group (shrews, mice, squirrels, bats, rabbits, etc.) and then sorted by specimen number onto new specimen trays. We matched skulls with skins, using guides to help differentiate types of mammals. Once the collection was sorted and skins and skulls were matched, we cataloged specimens that were chosen as good additions to our present specimens' holdings.



Looking at an Afghani woodpecker




Inspecting for ticks on Afghani porcupine

What Did We Learn?

We learned the responsibilities of being a mammalogist such as working on a collection, dissecting mammals, preparing the skins of such mammals, identifying the species of bats or other rodents by comparing the characteristics of their skulls with other skulls of similar looking species. We also learned how to identify organs of mammals during dissection. This experience working with Suzanne helped our knowledge of science grow and develop. Being able to work in Vertebrate Zoology has opened many opportunities for us to explore other fields of science.

What We Did

We organized and cataloged the Ryan B. Stephen's collection of mammals of skins and skulls of many shrews, mice and rodents in general. We also labeled skeletons of other collections. We also had the opportunity to help our scientist, Suzanne Peurach, dissect animals from Afghanistan such as a bird and a porcupine. After dissecting the animals we took body organ samples to preserve them for later observation. We helped Suzanne prepare the skins of the mammals after dissection.



Checking out the rodent collection

Acknowledgements

Thank you Suzanne Peurach for giving us the opportunity to work side by side with an experienced scientist like her. Thanks also to Elio and Amisa for granting us the opportunity to work at the Smithsonian.

This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center and a generous donation from the MARPAT Foundation.

Appendix B: 2011 Students' Demographic Characteristics

| <u>Characteristics</u> | | <u>Number</u> |
|------------------------------|------------------------|---------------|
| <u>School</u> | <u>Location</u> | |
| Benjamin Banneker SHS | DC | 3 |
| Bishop McNamara | MD | 1 |
| Bowie HS | MD | 1 |
| The Bullis School | MD | 2 |
| Gaithersburg HS | MD | 1 |
| Georgetown Visitation | VA | 1 |
| Holton-Arms School | DC | 2 |
| JEB Stuart HS | VA | 1 |
| Jefferson Science/Tech HS | VA | 1 |
| Langley HS | VA | 1 |
| McKinley Tech | DC | 2 |
| Montgomery Blair HS | MD | 1 |
| Nation House | DC | 1 |
| Northwestern | MD | 1 |
| Oxon Hill HS | MD | 1 |
| Parkdale HS | MD | 1 |
| Sasha Bruce | DC | 1 |
| Washington-Lee HS | VA | 1 |
| Wilson HS | DC | 1 |
| TOTAL | | 24 |
| <u>Age</u> | | |
| Thirteen | | 1 |
| Fourteen | | 4 |
| Fifteen | | 10 |
| Sixteen | | 8 |
| Seventeen | | 1 |
| TOTAL | | 24 |
| <u>Ethnicity/Race</u> | | |
| Latino | | 11 |
| Black/African/American | | 5 |
| Multiracial | | 3 |
| Caucasian | | 1 |
| Unknown | | 4 |
| TOTAL | | 24 |

Appendix C: 2011 List of Participating Scientists' Departments

| Characteristics | | Number |
|----------------------|--------------------------|--------|
| <u>Museum</u> | <u>Department</u> | |
| NMNH | Insect Zoo | 1 |
| NMNH | Entomology | 5 |
| NMNH | Paleobiology | 5 |
| NMNH | Invertebrate Zoology | 1 |
| NMNH | Libraries | 1 |
| NMNH | Botany | 1 |
| NMNH | Mammals | 1 |
| NZP | Lions and Tigers | 1 |
| NZP | Bird House | 1 |
| NZP | Reptiles | 1 |
| NZP | Asia Trail | 1 |
| NZP | Small Mammals | 1 |
| NZP | Amazonia | 1 |
| TOTAL | | 21 |

Appendix D: 2011 Guide for Scientists

Youth Engagement through Science (YES!)

Guide for Scientists

The National Museum of Natural History is committed to helping youth to develop the science skills necessary to be competitive in today's knowledge-based society. As part of its strategy, **Youth Engagement through Science (YES!)** will engage 24 high school youth from the Washington area with an interest or aptitude in science. The paid internship consists of two sessions: a 6-week Summer session & 12-week Saturday session in the Fall. The program will engage participants in meaningful research projects with Museum scientists, science staff, and researchers, and provide experiences to enhance their communication skills and support their college preparation activities.

Program Goals:

- To provide access to educational and career development opportunities in science to youth in the Washington, DC, region.
- To engage youth in authentic and meaningful scientific research to increase their critical thinking, communication, and other skills necessary to be competitive in a knowledge-based society.
- To engender a view of careers in science and technology as viable career tracks for youth to follow and provide college preparation assistance to assist enable the pursuit of those careers.

Program Timeline

| | |
|--|--|
| June 27 th – July 1 st | Program starts; Orientation week activities |
| June 29 th | Meet & Greet with Students |
| June 30 th | Students begin projects with scientists |
| August 5 th | Summer program ends |
| September 11 th | College prep workshops begin; students work on outreach projects |
| October 23 rd | Students take part in USA Science Festival on the Mall |
| November 20 th | Fall program ends |

Summer Schedule Breakdown:

Monday – Friday

9:00 a.m. -- 12:00 p.m. Students work with scientists on assigned projects

12:00 p.m. – 1:00 p.m. Lunch

1:00 p.m. – 3:00 p.m. Communicating science & presentation modules; education practicum

Your Role:

- _____
Project Sponsor (Instructor)

- _____
Supervisor

Elements of a Successful YES! Internship Project

Establish strengths of interns-

- _____
Subject matter should accommodate student's age, skill set and level of scientific understanding.

- _____
Student should not be placed on project that could exceed their set skills.

Training-

- _____
Allow set time table to train student on specific duties in department or on the project.

- Guide students through the scientific process of your work at a level appropriate to their comprehension.

- Introduce students to the research team and other members of the department

Understanding your line of work-

- _____
Identify the mission/ goal of current work done by you or your department

- _____
Assist students with educational materials on the nature of your work.
 - _____
Provide context about the work/ projects so that students understand where your work fits in with the goals of the project, department and Museum.

▫ _____
These materials can be articles, web resources, etc.

Identify the steps for achieving success in your line of work and on the project-

Select an activity that is essential in achieving that success.

Provide multiple activities for students to work on, as multiple perspectives help them to see and understand the progress and meaning of the work.

Establish a To-Do list with student.

Project topic should have set time table to be completed by the end of the program.

The project has to be significant to the mission/goal of the underlining research or work done by the department.

Action-orientated project such, as hands-on tasks, are the most beneficial for the students.

Using technologies that are of importance to the project and the research provide students with meaningful experience.

Rote, non-hands-on tasks, such as filing or scanning, should be avoided.

Provide periodic guidance for participants

Communicate with the student to Identify the challenges, barriers, or directions needed to complete a project.

▫ _____
Being able to track the progress of the student is crucial.

The students will be tasked to create a presentation of their work with input from you at the end of the program.

Reevaluate the progress of each student(s) to ensure it meets towards your aims.

Establish a time table or timeline for project work

Staying on course with the project deadlines.

Provide feedback and evaluation of participant’s level of communication, commitment, and abilities.

Project Outline:

Project Title:

Overall Project Goal:

Project Description:

Project Protocol (step by step): (e.g., Intern will sift through charcoal samples, then soak in water, and so on.).

Students will use both the communicating science skills they gained over the course of the program to present the work they did with you to the public on Community Day.

Here is an example of a project done last year by a former participant used for the their final project

Josephine Sanchez (Paleobiology)

Final Outreach Project – The Importance of Plant Fossils

--Visitors were presented with two real Pennsylvanian age plant fossils (over 300 million years old) and given sketches of two main types of plant venation. Using the sketches as a guide and magnifying glasses, visitors were asked to label the plant fossil with the correct venation type. Having real fossils available allowed Josephine to talk about her work in the FossiLab photographing these fossils and actually preparing them using a “mini-jackhammer” and a

microscope. She also spoke about the importance of plant fossils and how studying these fossils can tell us about the past; she explained how the information scientists gather today about the past can tell us something about our future, for example – climate change over time.

Community Day Presentation:

During the last week of the program, the interns will use what they have learned about presentation and communicating science skills over the course of the program to present the work they did with their scientist mentor in a science fair-style event. This event will allow students to bring family, friends, and members of their communities to view their projects and learn more about their summer experience.

Interns will be challenged to come up with a creative way to tell family and friends about their project and their experiences in the *YES!* Program. These ways will be executed in many forms of presentation such as poster boards, blogs, or short video just to name a few. Interns will have staff support and program time during the summer to develop and produce their Community Day Presentations.

The date for the Community Day Presentations will be during the week of August 1 and announced shortly after the program begins.

Anticipated Time Commitment:

- _____
Preparing a suitable project for the *YES!* intern

- _____
Meetings/communication with program coordinator before the start of the program

- _____
6-weeks in the summer of 2011,
 - _____
3 hours per day

 - _____
5 days per week

- _____
Working with the student to provide guidance and feedback on current project tasks.
- _____
Providing feedback to the program evaluator

Attendance Policy:

All *YES!* participants will sign a sign-in sheet each morning in the Office of Education & Outreach before reporting for their assignment with you. In the case of anticipated absences or tardiness, we have asked the students to contact the Program Coordinator as soon as possible who will also confirm that absence with you. In the event that a student does not turn up for their assignments, you should inform the Program Coordinator immediately.

Clothing and Presentation:

We have instituted a general dress code that calls for respectful attire. However, since each lab or department environment is different we ask that you consult with the students on appropriate footwear and clothing to wear while working with you (e.g. close-toed shoes, lab coat, long-sleeves, etc.).

Contact Information:

Should you have any concerns or questions during the program or about appropriate projects, please contact:

Elio Cruz
YES! Program Coordinator
cruze@si.edu
Phone: 202-633-0815/ Cell: 202-352-7038

If your project is selected, Elio will inform you of any changes to the regular *YES!* schedule in his weekly email updates.

Why Your Participation Matters:

NMNH will develop the Youth Enrichment through Science (*YES!*) program to provide equal access to educational and career development opportunities in science to underrepresented youth in the Washington, DC, region.

YES! can be a powerful program that shapes the bright minds of future scientists. It can also serve as a model for other museums within and beyond the Smithsonian. The dearth of minority scientists is growing and will only get worse. NMNH has the collections, scientists, and commitment to help shape the future of leadership in science and foster the development of new stakeholders in NMNH and the Smithsonian Institution.

This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center and a generous donation from the MARPAT Foundation.

Appendix E: 2011 Parent Informed 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 (15-20 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 in about a month and be about the *YES!* Summer program. The second interview will take place when the Fall *YES!* Program is near the end. In addition, we will read the applications to gain an understanding of why students chose to participate in the *YES!* Program.

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)

Kathleen M. Ernst, Senior Research Analyst, Office of Policy and Analysis, Smithsonian Institution, Washington, DC (office: 202-633-5589) (ErnstK@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.



Smithsonian
National Museum of Natural History

2011

Youth Engagement through Science
Parent Packet



Smithsonian
National Museum of Natural History

June 13, 2011

Dear *YES!* Intern Parent/Guardian,

We are delighted to welcome your child to the Smithsonian's National Museum of Natural History to participate in the second year of *Youth Engagement through Science (YES!)*.

In this *YES!* Parent Packet you will find a program overview, important contact information, field trip consent forms to sign, and answers to other questions you may have. More information can be found in the *YES!* Intern Guidebook, which your child will receive on the first day of the program.

The Smithsonian is deeply invested in training the next generation of future scientists, educators and innovators. We are excited to share with your child the rich and diverse work of the National Museum of Natural History in science, education, and communication in an immersive and fun learning environment.

If you have any questions about *YES!* or your child's involvement and activities throughout the summer, please feel free to contact me directly at (202) 633-1127 or watsonb@si.edu.

Sincerely,

Bill Watson, Ed.D.

YES! Program Components

1. Orientation to Science “Behind the Scenes” at the Smithsonian

During their internship, students will participate in a series of behind the scenes tours and conversations with curators and collections managers to learn about the 126 million objects in the museum’s collections and how scientists use them to study our world. They will also take field trips to other Smithsonian sites, including the National Zoo and Environmental Research Center, to explore science careers in a variety of contexts.

2. Research Projects

The core of the *YES!* Internship is the Research Project. Each intern will work on individual projects with Smithsonian scientists and science staff at the museum. The museum has over 200 scientists who conduct scientific research using a collection of more than 126 million objects. Interns will learn how scientists use the collections for a broad range of interesting research.

- a. Students may be placed in projects as pairs or individually.
- b. Students will be placed in projects that match their knowledge, skills, and interests.
- c. Safety is a priority for all placements and internships.
- d. Students will be trained to work with scientific materials, tools, collections, and technology required to accomplish their assigned projects.
- e. Each project will be a new learning experience that will help expand students’ abilities to think scientifically and their understanding of science and how science is done at this museum.

3. Museum Education Practicum

Interns will work with Education Specialists and Technicians in the Office of Education and Outreach to learn first-hand how the museum communicates science to the public. They will participate in many of the educational activities the museum offers. They will spend time interacting with the public and practicing skills for communicating about their research with visitors to the museum. Interns communicate with the public in the Discovery Room, Forensic Anthropology Lab, Insect Zoo, and in exhibitions throughout the museum.

4. Communication and Research Presentation Workshops

Excellent communication skills can do much to advance a career in science. All professionals must communicate on a daily basis, often both in writing and in speech; therefore, it's imperative that students learn to become skillful and effective communicators. Through a series of interactive workshops covering oral and written communication skills as well as research presentation skills, participants will learn guidelines and examples for communicating and presenting as real-world professionals.

5. Cross-Cultural Communication Experience

The *YES!* summer internship coincides with the temporary exhibition *RACE: Are We So Different?* at the National Museum of Natural History. The exhibition is about the everyday experience of living with race, the history of race as an idea, the role of science in that history, and the findings of contemporary science that challenge the foundations of race. *YES!* interns will receive training in cross-cultural communication and practice what they learn with rotations as volunteers in the *RACE* exhibition.

6. College Preparation (Fall)

During the Fall session, students will engage in a variety of workshops and activities focused on increasing their understanding and preparation for traditional college entrance exams, searching and applying for scholarships and grants, and ultimately college survival. The fall session will conclude with a tour of local universities to broaden students' knowledge of the opportunities available to them.

Daily Schedule

The *YES!* summer experience is a 5-day a week program, from 9:00 – 4:00 daily. **It is very important that students are on time for the program every day.** The *YES!* summer is an opportunity for growth in students understanding of science and science careers, and it is also an opportunity to learn career skills and responsibility.

Students will be given a detailed weekly schedule of activities and assisted by program staff as they adhere to it. They will know when program activities start and end each day. The outline below is a general overview of program start and stop times and the type of experiences students will have during their days.

| | |
|----------------------|---|
| 9:00 – 9:10 | Students Signs In with Program Coordinator |
| 9:10 – 12: 00 | Work on Research Projects with Scientists |
| 12:00 – 1:00 | LUNCH |
| | 1:00 – 4:00 Communication and Education Experiences (Museum Education, Cross-Cultural Communication, Workshops) |
| 4:00 | End of Day: Sign Out with Program Coordinator |

Holidays and Field trips

Monday **July 4th** is a Federal Holiday, your child will NOT report to the museum on that day.

The students will be taking several field trips this summer to other Smithsonian Institution sites. The field trips include:

| | |
|--|---------------|
| National Zoological Park | July 13, 2010 |
| Smithsonian Museum Support Center | July 22, 2010 |
| Smithsonian Environmental Research Center | July 28, 2010 |

Attendance procedures on these days will be the same as they are on regular program days, unless you and your child are specifically notified otherwise.

Absences and Tardiness

All interns are expected to be professional and report for their assignments on time every day. We understand some are commuting long distances, but we ask they respect our staff by being punctual. Should there be any planned absences, please write a note well in advance of the absence, sign it, and send it with your child to the Program Coordinator.

If your child expects to be late or unexpectedly absent on a day they are due to come in, the *YES!* Program Coordinator must be immediately notified by phone and/or email. The Program Coordinator will then inform the intern's supervisor. Missing a scheduled shift without contacting the *YES!* Program Coordinator will be considered an unexcused absence. After two unexcused absences or chronic tardiness, the intern's participation in the program will be reviewed.

At two unexcused absences, the *YES!* Program Coordinator will discuss the situation with the intern, their supervisor, and the Chief of Onsite Learning. The intern will be provided with an opportunity to improve his or her performance. If the intern fails to improve, the *YES!* Program Coordinator reserves the right to reassign or dismiss the intern from the program.

All of these actions will be fully discussed with your child.

Stipend Information

Students will receive a stipend of \$2,500 to help support their educational endeavors and participation in this program. They will receive two payments during the summer session and two during the fall. The Program Coordinator will tell them when to expect payment. If they do not receive their stipend at the appropriate times, please inform the Program Coordinator immediately.

Description of Final Projects

Community Day Presentation:

During the last week of the program, the interns will use what they have learned about presentation and communicating science skills over the course of the program to present the work they did with their scientist mentor in a science fair-style event. This event will allow students to bring family, friends, and members of their communities to view their projects and learn more about their summer experience.

Interns will be challenged to come up with a creative way to tell family and friends about their project and their experiences in the *YES!* Program. These ways will be executed in many forms of presentation such as poster boards, blogs, or short video just to name a few. Interns will have staff support and program time during the summer to develop and produce their Community Day Presentations.

The date for the Community Day Presentations will be during the week of August 1 and announced shortly after the program begins.

YES! Program Contacts:

Elio Cruz

YES! Program Coordinator

Email: Cruze@si.edu

Phone: 202-633-0815/202-352-7038

Juan Rodriguez

National Zoo/ *YES!* Partnership

Email: rodriguezj@si.edu

Phone: (202) 633-4381/703-307-3264

Bill Watson

Chief of Onsite Learning Venues

Email: WatsonB@si.edu

Phone: 202-633-1127

Zahava D. Doering

Lead Evaluator

Office of Policy and Analysis

Email: doeringz@si.edu

Phone: 202-633-5588

This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center and a generous donation from the MARPAT Foundation.

Appendix G: 2011 YES! Calendar

| 2011 Youth Engagement through Science Calendar | | | | | Week 1 |
|--|---|---|---|--|---|
| | June 27, 2011 | June 28, 2011 | June 29, 2011 | June 30, 2011 | July 1, 2011 |
| | Monday | Tuesday | Wednesday | Thursday | Friday |
| 9:00 AM | Intern Orientation Mary Sangrey Academic Office | RACE Exhibit Tour David Lacroix RACE Exhibit | YES! Ice Breaker Third Floor Rotunda Elio Cruz/ Amissa Jablonski | Project/ Zoo Orientation | Project |
| 9:30 AM | | | | | |
| 10:00 AM | | | | | |
| 10:30 AM | | | | | |
| 11:00 AM | | | | | |
| 11:30 AM | | | | | |
| 12:00 PM | Lunch | Lunch | Lunch | Lunch | Lunch |
| 12:30 PM | | | | | |
| 1:00 PM | YES! Orientation Elio Cruz Schremp Room | Amazing Orientation! Tania Mansoor & Hal Banks Schremp Room | Social Media Sarah Banks Cooper E-207 | CMAST Charles Britt Cooper Rm. E-207 | RACE Training David Lacroix Cathy Kerby CE-340 |
| 1:30 PM | | | | | |
| 2:00 PM | | | | | |
| 2:30 PM | Centennial Highlights Tour | | Visitors Perspectives Amy Bolton Cooper E-207 | | |
| 3:00 PM | | Logistical Meeting Schremp | | Project Journaling Cooper Rm. E-207 | Week 1 Recap Cathy Kerby CE-340 |
| 3:30 PM | Logistical Meeting Schremp Room | | Logistical Meeting Schremp | | |
| 4:00 PM | Check out | | | | |

| |
|------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

| | |
|---|--------|
| 2011 Youth Engagement through Science Calendar | Week 2 |
|---|--------|

| | July 4, 2011 | July 5, 2011 | July 6, 2011 | July 7, 2011 | July 8, 2011 | |
|----------|---------------|--|---|--|--|------------------------|
| | Monday | Tuesday | Wednesday | Thursday | Friday | |
| 9:00 AM | Holiday | Project | Project | Project | Project | |
| 9:30 AM | | | | | | |
| 10:00 AM | | | | | | |
| 10:30 AM | | | | | | |
| 11:00 AM | | | | | | |
| 11:30 AM | | | | | | |
| 12:00 PM | | Lunch | Staff Picnic Folk Life Festival | Lunch | Lunch | |
| 12:30 PM | | | | | | |
| 1:00 PM | | RACE Training David Lacroix Cathy Kerby CE-340 | Forensic Anthro Lab Gale Roberston Forensics Lab | Butterfly Pavillion & Insect Zoo Training Dan Babbitt | Cart Training Hal Banks Schremp Room | |
| 1:30 PM | | | | | | |
| 2:00 PM | | | Project Journaling Cathy Kerby CE-340 | Project Journaling | CMAST Charles Britt Cathy Kerby CE- 340 | Bird Lab Carla Dove |
| 2:30 PM | | | | | | |
| 3:00 PM | | | | | | |
| 3:30 PM | | Week 2 Recap Schremp Room | | | | |
| 4:00 PM | | Check out | | | | |

| |
|--------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

| | |
|---|---------------|
| 2011 Youth Engagement through Science Calendar | Week 3 |
|---|---------------|

July 11, 2011 July 12, 2011 July 13, 2011 July 14, 2011 July 15, 2011

| | Monday | Tuesday | Wednesday | Thursday | Friday | | | | | | | |
|----------|------------------|----------|-----------|------------------|---------|----------|----------|-----------|----------|----------|----------|-------|
| 9:00 AM | Project LONG DAY | Project | Project | Project LONG DAY | Project | | | | | | | |
| 9:30 AM | | | | | | | | | | | | |
| 10:00 AM | | | | | | | | | | | | |
| 10:30 AM | | Lunch | Zoo Trip | | | Lunch | | | | | | |
| 11:00 AM | | | | | | | | | | | | |
| 11:30 AM | | | | | | | | | | | | |
| 12:00 PM | | CMAST | | | | Zoo Trip | Lunch | | | | | |
| 12:30 PM | | | | | | | | | | | | |
| 1:00 PM | | | | | | | | Lunch | Zoo Trip | Lunch | | |
| 1:30 PM | Lunch | Zoo Trip | | Lunch | | | | | | | | |
| 2:00 PM | | | | | Lunch | | Zoo Trip | | | | Lunch | |
| 2:30 PM | | | | | | | | Lunch | | Zoo Trip | | Lunch |
| 3:00 PM | Lunch | | Zoo Trip | Lunch | | | | | | | | |
| 3:30 PM | | | | | Lunch | | | | | | Zoo Trip | |
| 4:00 PM | | | | | | | | Check out | | | | |

| |
|------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

| | |
|---|--------|
| 2011 Youth Engagement through Science Calendar | Week 4 |
|---|--------|

| | July 18, 2011 | July 19, 2011 | July 20, 2011 | July 21, 2011 | July 22, 2011 | |
|----------|--|--|--|---|----------------------------|--|
| | Monday | Tuesday | Wednesday | Thursday | Friday | |
| 9:00 AM | Project | Project | Project/LONG DAY | Project | Project | |
| 9:30 AM | | | | | | |
| 10:00 AM | | | | | | |
| 10:30 AM | | | | | | |
| 11:00 AM | | | | | | |
| 11:30 AM | | | | | | |
| 12:00 PM | Lunch | Lunch | | Lunch | Museum Support Center Trip | |
| 12:30 PM | | | | | | |
| 1:00 PM | Beetle Collection Tour Gary Hevel Entomology CE-716 | Free Period | Lunch | CMAST Charles Britt Cathy Kerby CE-340 | | |
| 1:30 PM | | Public Interaction Rotations | | | | |
| 2:00 PM | | | | | | |
| 2:30 PM | Trip to American History Museum | Project Journaling & Logistics Schremp Room | RACE Training David Lacroix Cooper E-207 | Project Journaling & Logistics Cathy Kerby CE-340 | | |
| 3:00 PM | | | | | | |
| 3:30 PM | | | | | | |
| 4:00 PM | Check out | | | | | |

| |
|------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

| | |
|---|--------|
| 2011 Youth Engagement through Science Calendar | Week 5 |
|---|--------|

| | July 25, 2011 | July 26, 2011 | July 27, 2011 | July 28, 2011 | July 29, 2011 | | | |
|----------|--|--|---|-----------------------------|---|--|---|--|
| | Monday | Tuesday | Wednesday | Thursday | Friday | | | |
| 9:00 AM | Project | Project | Project/LONG DAY | Project | Project | | | |
| 9:30 AM | | | | | | | | |
| 10:00 AM | | | | | | | | |
| 10:30 AM | | | | | | | | |
| 11:00 AM | | | | | | | | |
| 11:30 AM | | | | | | | | |
| 12:00 PM | Lunch | Lunch | SERC Trip Karen McDonald | SERC Trip Karen McDonald | Lunch | | | |
| 12:30 PM | Lunch | | | | Lunch | | | |
| 1:00 PM | Paleo Tour David Bohaska E-109 Group 1 | Ant Lab CE-5 Ted Schultz/ Eugenia Okonski | | | Guest Speaker Joshua Bell Anthropology Rose Room | SERC Trip Karen McDonald | CMAST Charles Britt Cathy Kerby CE-340 | |
| 1:30 PM | Ant Lab CE-5 Ted Schultz/ Eugenia Okonski | Paleo Tour David Bohaska E-109 Group 2 | | | Public Interaction Rotations | | | RACE Training David Lacroix Cooper E-207 |
| 2:00 PM | | | | | | | | |
| 2:30 PM | Ant Lab CE-5 Ted Schultz/ Eugenia Okonski | Paleo Tour David Bohaska E-109 Group 2 | | | Public Interaction Rotations | RACE Training David Lacroix Cooper E-207 | CMAST Charles Britt Cathy Kerby CE-340 | |
| 3:00 PM | | | Project Planning Cathy Kerby CE-340 | | | | | |
| 3:30 PM | | | | | | | | |
| 4:00 PM | Check out | | | | | | | |

| |
|------------------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet/ Guest Speaker |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

| | |
|---|--------|
| 2011 Youth Engagement through Science Calendar | Week 6 |
|---|--------|

| | August 1, 2011 Monday | August 2, 2011 Tuesday | August 3, 2011 Wednesday | August 4, 2011 Thursday | August 5, 2011 Friday |
|----------|--|----------------------------------|--|---|--|
| 9:00 AM | Project | Project | Project *Last day for work on NZP projects | Project | Project |
| 9:30 AM | | | | | |
| 10:00 AM | | | | | |
| 10:30 AM | | | | | |
| 11:00 AM | | | | | |
| 11:30 AM | | | | | |
| 12:00 PM | Lunch | Lunch | Lunch | Lunch | Final Lunch Room TBD |
| 12:30 PM | | | | | |
| 1:00 PM | RACE Training David Lacroix Cathy Kerby CE-340 | Meteorite Vault Cari Corrigan | Final Project 1st Draft Rose Seminar/PC Room | CMAST Charles Britt Cathy Kerby CE-340 | Final Project Final Draft Rose Seminar/PC Room |
| 1:30 PM | | | | | |
| 2:00 PM | | | | | |
| 2:30 PM | Final Project Cathy Kerby CE-340 | Final Project Rose Seminar | | Final Project Rose Seminar /PC Room | |
| 3:00 PM | | | | | |
| 3:30 PM | | | | | |
| 4:00 PM | Check out | | | | |

| |
|--------------------------|
| Training |
| CMAST |
| Field Trip |
| Lunch |
| Meet with Coord |
| Meet/Greet/Guest Speaker |
| Project |
| Public Rotations |
| RACE Training |
| Tour |

Appendix H: 2011 OP&A *YES!* Program Interview Guides

***YES!* Program Student Interview Guide:**

Interviewer:

Name of Student:

Date Interviewed:

Why did you want to participate in the *YES!* Program?

What were you expecting when you first entered the program?

What was your specific project and what did you learn?

What was your relationship like with the scientists you worked with and other staff members?

What was your relationship like with the other students?

What did you like about the program? What was your favorite part?

What did you dislike about the program?

What did you gain from your participation in *YES!*?

Would you recommend this program to others?

How would you suggest we improve the program?

YES! Program Scientist Interview Guide:

Interviewer:

Name of Student:

Date Interviewed:

- a. How/why you got involved in *YES!*?
- b. Did the *YES!* staff provide you with enough information about the student and what was expected to you?
- c. What were your expectations of what the student would do for you/you for the student?
- c. Were your expectations met?
- e. Would you participate again?
- f. What comments do you have about the *YES!* program and how would you improve it?