An Assessment of the 2012 Youth Engagement through Science Program

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Abstract

The Office of Policy and Analysis (OP&A) conducted a qualitative evaluation of the 2012 YES! (Youth Engagement with Science) program that showed the program has had its most successful year since it was established in 2010. The *YES!* program at the National Museum of Natural History (NMNH) provides minorities and underprivileged high school students exposure to the sciences by pairing them up with a professional in the field. For 2012, mentors from 19 NMNH departments, the National Zoological Park and the Smithsonian Gardens provided experience for 25 *YES!* students. OP&A staff and interns collected data for the evaluation by observing students' behavior during their internship and conducting personal interviews of students and their scientist mentors. OP&A suggestions for the 2013 *YES!* program include double-checking students' socioeconomic qualifications, better preparation of first-time mentors, a major cut-back in the time allocated to public rotations, providing additional information about the program on Smithsonian websites, extending the program, reaching out to potential participants, and eventually scaling up the program to 75 students.

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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 third 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 2012 assessment that will form the basis for improving the program in 2013.

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 interns, Kamran Ali, Yifei Chen and Hannah Pheasant assisted with all aspects of the assessment, undertook responsibility for interviewing the *YES!* participants and transcribed students' and scientists' interviews. Kamran Ali wrote the first draft of the students' section. Yifei and Hannah worked since the summer program ended to draft all the report sections, ancillary materials and review the final product. I thank them all.

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Introduction and methodology

Introduction

The National Museum of Natural History (NMNH) is committed to helping youth develop the science skills necessary to be competitive in today's knowledge-based society. As part of its strategy, the *Youth Engagement through Science (YES!)* program was designed as a way of engaging high school youth from the Washington area with an interest in science in laboratory and science-related museum activities. NMNH began the *YES!* program in the summer of 2010. The program has continued for two years and evolved with some major changes based on the assessments OP&A conducted of the 2010 and 2011 programs.

Goals of the *YES!* program include:

- 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 enable the pursuit of those careers.

The *YES!* Program provides the students selected to participate 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 sessions about museum education and programs; and create a final presentation, structured as a scientific poster session on what they learned during the *YES!* program. Every student is paired with a scientist who acts as both mentor and supervisor. The scientists, animal keepers, horticulturists, and technicians in the 2012 program were staff volunteers from either the NMNH, or the National Zoological Park (NZP), or and the Smithsonian Gardens (participating for the first time in 2012). Students received a stipend of $1,750 for their participation in the *YES!* program.

In summer 2012, the *YES!* program had 25 students throughout the summer. Three of the students in the summer 2012 *YES!* program also participated in the 2011 *YES!* program. The students, primarily ages 14 to 16, attend local high schools in the Washington Metropolitan Area. Nine of the students were in 9th grade, 10 in 10th grade and the smallest group (6) were in 11th grade. The racial/ethnic makeup of the 2012 students was strikingly different from previous years. About half of the students had a Latino background; the rest

were mostly African-American and a few were Caucasian. In previous years, the majority were Caucasian.

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 director and 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.

Methodology

As was the case in both 2010 and 2011, two senior staff members and several interns worked on the assessment project for the 2012 *YES!* Program. In general, the staff interacted with *YES!* education staff and the scientists; and the interns interacted with participating students.

At the beginning of this year's program, OP&A received application essays of students accepted into the program. This helped the OP&A team understand the participants' stated motivations and their demographic characteristics.

Another method of data collection was observation by OP&A staff and interns of the *YES!* orientation, public rotations, some classes, field trip to the Museum Support Center (MSC), and the final showcase of their internship achievements at the poster session.

The main source of data for this report, however, came from personal interviews of participants. OP&A interns interviewed all 25 students face-to-face by the end of the program. Staff joined interns to interview scientists both in person and over the phone.

The interview questions were designed to get both positive and negative feedback from students and scientists. Students were asked questions like: why they chose to participate; what their experiences were; what they did for their internship; how they interacted with their assigned scientist, the coordinators, and 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.

Scientists were asked general questions such as 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.

In the next two report sections, the findings from the interviews are summarized.

Student Feedback

Reasons for Participation

Students had a variety of reasons for participation in the *YES!* program. Some students were participating in teen programs at "Mary's Center," a health and social services center in Washington, DC that introduced them to the *YES!* Program and even organized a tour for the students around the National Museum of Natural History before the application deadline. One student who was involved with Mary's Center said,

> "Since I am in this other program called Mary's Center […] one of the mentors there told me [the *YES!* Program] was about science and since I'm into science and they knew that I wanted to be a forensic anthropologist they were like you should go there"

Another student said,

> "The Mary's Center, they introduced the program to all of us. They asked me if I wanted to apply and I even came on a tour around the building."

One student heard of the *YES!* Program from a friend who had participated before:

> "One of my close friends, when the *YES!* program first opened, was in that program. She was telling me how much fun she had, how she met so many cool people, and how she made so many new friends."

Other students were intrigued by being able to see parts of the museum that they would not otherwise have gotten to see:

> "The fact that you could actually go see the different types of things that happen around the museum that other people can't see or aren't allowed to see and the fact that you get to work with other kids your age with good mentors."

> "Get to see the other parts of the museum that other people don't get to see."

> "I wanted to see what goes on behind the scenes of the Smithsonian."

Certainly, the *YES!* Program attracted students who were interested in science. As one female student commented,

> "It seems like the work was meaningful […] it was like you're actually going to be helping them, using real equipment and I think the real experience was what drew me to it."

"Well I've always liked science so I was really excited to learn about science in a different perspective and not from a classroom and from a textbook but actually working with a scientist and doing experiments."

Many students also cited the reputation of the Smithsonian and the positive impact it would have in the college application process:

"I am sure this will look good on my college record."

"Just the experience and it's an internship so it will look good on college applications."

"It's about science and the reputation of Smithsonian."

Despite the stipend of $1750 given to the students over the duration of the *YES!* Program, very few students mentioned it as a primary reason for participation. Of those that did, it was often a secondary motive:

"I wanted experience…in working in a professional setting and at an actual job because then it will show that I have responsibility. Also money, the stipend."

"It's a good thing to put on your resume and there's also a stipend so that's another bonus."

"As teenagers we want to make money to feel accomplished and there are a lot of things we want right now and with money you can buy it"

Expectations

When inquiring about the students' expectations, it was clear that most of them did not have a clear idea of what their internships would entail:

> "I was expecting we were going to do chemical reactions, have lab coats…do experiments and dissect things"

> "I didn't have many expectations." "I would have liked a description of different programs they have so I have an easier time of choosing."

> "I wasn't expecting to work inside the museum. I thought we were going to be away from the museum"

> "When I thought of public rotations, I thought I would be like one of the people in front of the entrance welcoming them and giving a tour, not actually doing the carts."

> "I thought there would be a lot of reading and lectures."

However, despite their mixed expectations, students seemed to be very content with how the program turned out to be. For example, one student said,

> "I envisioned it differently […] I thought it was going to be less fun, but it's actually very interesting [...] and I really like the scientist I'm working with"

Another said,

> "I was expecting we'd me in a room doing math and reading science papers. Right now everything is hands-on and I didn't expect that […] I was really excited, I was really happy, I'm like 'woah' I'm working in here with a scientist"

Nature of the Work

Students had different levels of understanding about the nature of the work and its importance to the overall work done by the scientists. In the two instances described here, it is clear the students did not understand how their work fit in:

> "I thought our project would be more serious, I feel like I think they just gave us this project because they needed for us to do something, it was just for the sake of us doing something, I don't think it was really necessary.

> “I'm pretty sure if they wanted measurements on the[…] they probably gotten it done a long time ago, because this is the Smithsonian. We're not even going to finish all the […] ...I’m not even sure that's even going to help them"

Staff and Peer Relationships

Students were asked about their relationships and interactions with their scientist mentors, *YES!* Program staff, and their peers. Most students had overwhelmingly positive things to say about their scientist and there were no negative comments:

> "We have a really cool relationship and she treats me like I was one of her interns."
>
> "She is amazing. She is so nice." "She exposes us to so many things that we didn't expect to be exposed to."
>
> "It's good, I don't feel like I have to be a good girl around her, we joke around…I feel like normal, like we're friends"
>
> "We bonded very well. The first time we met it was just like a connection. We both speak [language]...it’s easy for me and we have a lot of things in common"

When asked about their relationships with the *YES!* Program Staff, students responded either positively or felt that there was not really much interaction between the Staff and students. Those who felt they had good relationships said:

> "…Everyone is pretty cool. I like how everyone is serious when they need to be, but you can have a fun conversation with them
>
> "It’s good." "We've built a nice relationship, we talk about anything"
>
> "They are really cool. It’s fun talking to them about their college life and they are really open."
>
> "I like how they are young so they are easy to speak to and they are fun. It makes it a really good environment."

Of the students that reported that they didn’t develop relationship with the staff, most said that conversations and interaction with the staff were sparse:

"It's not like that much [interaction] […]. Like we talk about work stuff, we don't have a real relationship"

"We're not around them so much that we have anything to love them or hate them about. It's just like a mentor mentee type thing, it's really basic."

"We have conversations once in a while, it's not like super close" "They're really nice, they're cool"

All the students interviewed reported making new friends as a result of the program. Almost all of the students said that they would like to stay in touch with some of the friends that they made over the summer. However, some did report that cliques were quickly formed between the students and that most students primarily interacted within their fixed social circles.

"Everyone is really nice. We all get along pretty well. We can all talk to each other […] I'd like to" [stay in touch] […] I've made quite a few friends"

"After the first week we got into little cliques […]. It's not a bad thing, it's just that some people had more things in common than they did with others"

"They are really nice. I've got to make a lot of new friends so after the program we can sometimes hang out."

"I don't talk to some of the kids in the program. We have our own group. I'm in one group, they're in another group"

"I came in without knowing anyone; but I am coming out knowing everyone. We hang out for dinner and we text each other."

"With some of them I'm really close and we became really good friends and with some of them we're just like acquaintances."

Student Favorites

Of the activities that students cited as being their favorite, the various tours and public rotations were mentioned most often. Students also mentioned working on their projects and the communication trainings among other things they liked about their experience. It is important to note that at the time these interviews were conducted student's had not yet gone on the field trip to the Smithsonian Environmental Research Center (SERC).

One student who felt that the rotations really helped her public speaking skills said,

"I'm surprised because I'm a pretty shy person, I'm usually pretty bad at talking to people, but I found them to be a lot of fun. I liked being able to talk to the kids […] I think it's a lot of fun […] talking to them was actually easier than I thought it would be"

Another student said,

"I like public rotations, it's kind of fun to see how people look at the museum and interact with it and how other people walk on by."

Many of the students that enjoyed the field trips commented that they liked the change of pace from the regular work day and being able to see the collections in storage:

"Probably all of the tours we go on because you get to see a little bit of everything and the highlights of each department."

"Favorite trips were the Zoo and the Front Royal one […]. They were really interesting and they gave us a break from our regular work to do something different, It was really educational and it was cool."

"I like the MSC trip because last year we didn't really see the collections […] The Front Royal trip, I liked it because I got to see the clouded leopard"

"I like the fact that we can be behind the scenes so we actually get to learn and see different things that we don't normally see".

Some students expressed their love about the actual internship.

"Working on my project" "Because first I didn't know much, but once I got it it was really cool to be able to do things and know what you are doing"

"I like the fact that I am working with the scientist. This is the first time I've ever done something this cool." "Also working in a federal government property…most people my age…wouldn't be doing something that I'm doing."

Classes that focused on improving students' communication skills have interested a great number of students.

> "I think that all the training sessions like the CMAST ones were very useful. I did learn a lot from those and they taught communication skills and some other skills too … "Some of it was like you already knew it, but now that we did the activities you kind of see that it has a bigger impact than you already thought."
>
> "I think when we have our communications sessions with Charles Britt. He is a fun guy and he makes the sessions really interactive. They are interesting, they aren't like boring. He's cool."

Two students described their favorite part of the program as financial support and killing leisure time.

> "I guess that I'm getting paid. That's a major plus."
>
> "Just something to do everyday. Summer kind of gets boring for me…this internship gives me something to do. At least my whole day is filled up"

Least Favorite Student Experiences

Students tend to have different tastes when it comes to their least favorite part of this year's *YES!* program. Answers include commuting, getting to know people, problems they encountered during work, and the repetitiveness of their work.

> "I hate taking the shuttle, I don't like going all the way out to Maryland." "I'd rather just come here and stay here, because it's like a hassle." "I'd rather just work here (NMNH)." "It's not difficult it's just repetitive." "Getting my ways around. Like sometimes we had to go to [different rooms in the museum] the second week I got a little lost." "Also knowing when I came out of the bus what street, that was a little difficult."
>
> "I mean at first meeting new people, but that was at the beginning." "I was kind of scared of bugs but now I'm used to it." "The most difficult part was the beginning, getting to know everyone, what I was doing." "Maybe they could have more icebreakers…to learn about the people."
>
> "Just adapting to the work, but I mean that's typical" "I didn't really find anything difficult, it's pretty straightforward, what to do how to do it and you pick up from there."

"Well the walking…at the Amazonia you have to pick up stuff and I had to go water the plants, I'm small and the hoses are really really strong. So some of the things they told me to do, I didn't want to say no, but I had to go do it. They were kind of like a little bit too much work, like hard work."

"Me sitting behind a desk all day and looking through a microscope, sometimes it gets a bit repetitive and boring"

"The elephant cart because it has mammoth teeth, and the elephant, and the tusk and that's it. You can do activities with it but they're only like 5 second activities, not really interesting."

"Well I was supposed to be at the animal hospital for two hours, but Dr. Hope even said that was too short...so they extended it to half a day...so one thing I think you should have one day for the hospital and one day in the Amazonia or just hospital as just one. Because the hospital they do so much." "The walking, I worked at the Zoo Amazonia and the hospital and Amazonia is the last exhibit."

"In my project when you had cataloging and some of them were tedious stuff…I didn't really like that."

"Sometimes when we're doing the public rotations, there are some visitors that are hard to work with." "The only thing is that my project is kind of repetitive, but I find that that's actually a positive thing because in the future there are going to be things that are repetitive."

About one fourth of interviewed students said they didn't like public rotations. The reason was either they didn't like the work they were assigned for public rotations, or they were uncomfortable talking to visitors.

"Public rotations, because at first I was shy and I didn't know what to do. I relied on my other classmates to talk and stuff, I wasn't ready to talk to the public yet. But then after I got used to talking to the public, I talk a little bit more and more, but I still rely on my classmates to help me when I'm stuck."

"I think one thing I didn't really like was one of the public rotation stations and it was the Discovery Room. It wasn't bad, it's just that I kind of wanted something more to do instead of tidying up and watching the kids do stuff. I kind of wanted more than just that."

"You don't do much, everything is hands on and everyone just goes in their own direction. All they really ask you to do is to tidy things up when they leave." "If they

gave us more to do I would like it better, like give me a certain thing to talk about or like certain part in the Discovery Room and I help explain to kids." "If there was more direction and organization in the Discovery Room I would like it better."

"Public rotations. I like being there and talking to people. But sometimes it is very tiring in the morning." "Public rotations are kind of long sometimes." "My least favorite part is public rotations in the morning. They asked questions that you may not know the answer."

One student complained about the repetition of tasks. He said he disliked this program because it was nothing like what he expected. During the interview, he exposed things he observed as “annoying”.

"I always like doing something different, I don't like doing the same thing every day."

“Unorganized” was identified as a big problem by nearly half of the students.

"It is a little unorganized. It's a lot sit and wait." "I didn't even know the project until the first day of work."

“Unorganized, lots of walking, more interesting carts!!!”

"A little bit more organized. Like sometimes we just wait at a table for an hour or 30 minutes just talking and not doing anything while we're supposed to be doing stuff, it's a little bit unorganized."

"In the morning our report time is 9:30 and Elio will walk in at 9:30, but we'll just sit there for half an hour to 45 minutes...and at lunch we have this roundtable discussion thing, I mean I just want to eat my lunch." "It's always like 'ohh I have something to do during my time." "I don't like these discussions; the communication training isn't so bad because it's necessary for public rotations, but these discussions...sitting down in a room and learning about someone else and what they do because it's kind of repetitive."

"How we were split up. We don't get to see the A Team every day." "In the schedule, sometimes they change it and I don't like that, focus one thing, are we going to do that or are we going to do things on the schedule"

"That the kids don't interact, we all have our own groups and that sometimes we don't talk to them" "We should all collaborate together and talk"

Students also mentioned round table discussion and the fact that they were forbidden to touch all animals as their least favorite parts.

"And the round table discussions are boring a lot of times." "It's just not interesting…it wasn't any new information that I didn't really know" "I would say get more exotic fields, maybe a meteorologist, see what they do...or like an FBI mortician." "I don't like just listening to people talking. Some of them are just boring." "Some of the roundtable lunch time is boring."

"Even though people didn't like Front Royal Virginia, I thought it was interesting." "We only got to see three animals, but I still liked it...they're complaining that they didn't get to touch them, but I mean if you want to get hurt."

Lessons Learned and Benefits

Most students are satisfied about the opportunity they were given to actually do what they have always been interested in.

"I've always like science, but just in general so I never knew much about the different branches, but this program has helped me to know more about each of them and helped me see the different things." "What I am interested in is going to

the human body when I get older. So working in the lab gives me experience in this field."

They also learned more about how a museum works.

"I've learned that it takes a lot of effort to keep up with the museum expectations and the public expectations about the exhibits and how they should be shown and presented."

"I guess you wouldn't want to go to a museum to see a trashy insect case."

“There are a lot more in this museum than what is out there."

"I found out there's a lot of other work with the science that’s not what people would generally connect to it, like all the paperwork you have to go through before you can actually catalogue it, or dissect it, or send it to other institutions."

Some students improved their communication skills.

"I really improved in my communication skills. Like before I was a little bit shy when it came to talking to the public and having to explain things to them at times. After doing it more than one time and with other people with me, it kind of got easier and better so I think I've gained better communicating skills."

"I'm definitely not as shy as I used to be because we have to do the public rotations and everything and also just how to communicate with people and act professional." "It helped me try to convey certain points to people quickly so they don't get bored."

"It has helped me with my public speaking because before when I had to in school do a PowerPoint presentation in front of the class I would get really nervous and now it’s something just natural, I've been able to feel more confident. And it sounds crazy because it has only been 5 weeks and it has gotten better."

"I learned communication skills, I made some new friends and hopefully that will be able to be a long term relationship. It was a nice experience to be able to say you are working and know you are making use of your time over the summer."

"Also with the public rotations I think it'll help in the long run with my public speaking."

Two students found the summer internship helped them shape their future career path.

"I think it'll help me a lot in deciding what career I want to choose." " (In terms of shaping career path) Not a little, a lot. I wanted to study to become a lawyer, but I

wasn't sure what field." "It kind of shaped it in a way." "They have given me the background, the basic."

Other things students found useful were experience to list on a college application and the stipend.

"And it's experience, I'm pretty happy that I got to do something, I mean it looks good on college applications."

"To be able to say in the future that I interned in the Smithsonian doing this."

"It would look good on college applications, on my resume and if I maybe want to intern here again."

"Well, money, the stipend. I mean that's good."

"Everyone raised their hand and said stipend. I guess for a kid that is kind of important. I guess I would have done it even without it, but now that I'm almost done with the program, I'm thinking I would have done something different with my summer."

"I doubt many people would really look at this program...the only reason they applied is because their teacher told them they were getting paid." I feel like all of them except one or 2 [are doing it for the stipend]" "A lot of people openly say they don't want to do this, they would rather be at home, but they are doing it because they are getting paid." "Less people are thinking about the experience and more are thinking about the money."

When asked "would the program attract the same kind of people if there was no stipend?" he said: "Probably not because as teenagers we want to make money to feel accomplished and there are a lot of things we want right now and with money you can buy it." Another student agreed with him when asked the same question.

Schedule and Program Length

The majority felt the length was just right.

"I think the six weeks is fine."

"I think it's a good time to get a project in."

"For each day, I think there are good points and bad points because you have a change of pace in the afternoon, but also its hard because once you start doing something it's like, oh I already have to go."

"I've really liked my schedule how I get to work on a project in the morning and then there are tours and training that you get to see behind the scenes ... and you get to know more about the Smithsonian and what they do."

"I think it was appropriate, I was fine."

"I think it was fine, it wasn't too much. It kind of felt like a school day." "I think it was right, the whole thing was right."

"It's pretty good because it still gives us a couple of weeks of summer left." "I think it has just enough time to experience and do what they do every day."

Some students preferred the program to be longer.

"I prefer it to be longer."

"I think it was really short, it went by so fast. I wish it was much longer." Even wanted to have it on the weekends. "Every day would be cool, but I don't think most people would agree with that…some people have obligations, but for me I would prefer every day of the week."

"I wish that we had at least three times a week where we would go to our projects…or if I could go every single day to my project that would be nice because 1. I would learn more, 2. I have more time to actually focus and work on my project than when I go twice a week it's a little harder because then I would want to stay a little longer just to work on it."

"This program went by fast. It may be better if it's longer."

"Having more days for the project.

"Three days of project and only two days for public rotations."

Few students thought the time was too long for this program.

Effect on career choices

Most students found the program helpful in terms of exposing them to what real science is.

> “It has actually opened my mind more to other professions there are like cultural anthropology or marine biology."
>
> “…and it did help me change my career choice, which saves a lot of money."
>
> "I learned what it takes to be a zookeeper and how the Smithsonian keeps its stuff up."

> "Now I have a lot more experience and I've actually been to labs."
>
> "Experience with experiments, working with the specimens."
>
> “I actually met people that were in that profession and doing stuff and that are what got me interested in it."
>
> "The fact that I can say that I worked at the Smithsonian I think that helps because it’s all science."
>
> "I think that this experience that I have gotten helps me to see okay I don’t want to do this or I want to do this"
>
> "So this has helped me see the different departments and branches to science."

"This program sparked my interest in science again."

"Yeah because whenever we went to MSC we got to see what some of the geneticists and some of the people that work with DNA get to do."

The program also helped students get to know what they didn't like.

"I wanted to be a veterinarian, but now I want to be a zoologist. Since I've been in the hospital, I love animals, and I've noticed in the hospitals they get the animals awake and they have to put them to sleep during the procedure and I want to see the animals in action, animal behavior that's what I'm most interested in. So I'm glad that I got to go to the hospital, because then I would have figured out my first year in college that veterinarian is not me."

"I learned that I don't like sitting behind a desk all day and it may not be the job for me."

"I know I don't want to do this, like research I guess and like biology, so I guess I learned that through experience."

"Yes, probably in the medical field."

"I was thinking about going into a math field before, probably engineering, but now I'm kind of going towards the science side."

"It's more fun, its more out there, you can just be with a lot of your coworkers."

"Science, but not biology. Computer science, nanotechnology, something more with tech and engineering."

"It helped me decide that, earlier I wasn't sure...but now I know that that's one thing that I'm not going to come remotely near."

Student Suggestions for Improvements

Students wanted more interactions with their scientists/mentors.

"I wish they could send our mentors an email and we can know who we are going to work with beforehand." [The projects] "need to be more scientist related." "My project is just filing and data basing so I feel like I want to do more than that."

Suggestions to the program itself include adding more interesting activities, expanding to other museums, more flexible schedules, and offering lunch.

"I think they should put more carts available and put more interesting activities in the carts."

"With the Zoo trip that we took, it would have been more fun if we actually got to interact with some of the animals there rather than just seeing them because it just felt like a normal trip to the zoo not like behind the scenes." "Maybe some more fun carts." (This student said the Elephant Cart and Mineral Carts were not fun. She feels that they should be fun for both the visitors and the participants.)

"Probably go and see the different museum artifacts more like the rocks or the geology (of NMNH) in the storage that the public can't see." "Like how we went to MSC, like go to more places like that to see what people have to offer." "At the zoo actually go behind the scenes, not just where the regular people get to go."

"I think they should have it in other museums, like they could branch it out to NASM, NMAI, or NMAH." "Maybe you can expand to more Smithsonian museums…like NASM." "In the public rotations maybe getting out of the Natural History Museum because there are only a certain amount of places you can actually go, so sometimes they get repetitive."

"As I said, the time. Like if you guys could take it to 9:30 and take it far to 4:00 or something." (He wouldn't mind ending later if starting later.)

"You can lessen the amount I guess, like not give anything for the fall session...you're practically getting paid to go on tours and learn." "For the work that you do during the 6 weeks in the summer you should get a $1,000 for that not $1,750."

"Maybe if they would let us go out more to get our own lunch."

Students also wanted more planning and for public rotations to be much more organized.

"If we were actually rotating…that would be better." "Earlier you got to try out everything…now since we've done everything, everyone is always fighting for the insect zoo."

"More organized for public rotations." "We only have five options so people get bored after they try all of these."

"I think they should tell us more about the project before we come here." "I wish we can contact scientists after the program."

"I felt like it needs a little bit more planning because often times in the mornings before we do the public rotations we kind of just sit there and talk and wait for the museum to open and have visitors as well as figuring out what station we would be at and which cart."

Recommend Program to friends?

When asked if they would recommend the program, everyone either said yes or maybe, given that the person they were recommending loves science and/or research.

"It's a really good program because if you really like science and if you're involved in science or you want to be involved with science then the *YES!* program is the perfect program to apply for."

"Yeah I would. It depends if you really are interested in science, I think this program would help a lot. But if you're not, it could probably open a door to science."

"Yes, it's more engaging instead of staying at home playing video games. You can do something productive over the summer and it can help your resume and get into college."

"Yes, if they are interested in science, but if they are not they're going to be bored and I wouldn't do it."

"Yes because it is fun, you get new experience, and you get behind the scenes in the museum which I think is really cool."

"If those people are students that I know either love research or if there was still going to be a stipend. If they don't like research, science, or biology, I wouldn't recommend it.

"Definitely." "Especially for people that like science because it helps you to get experience and really see what the different branches in science and help you see if you want to do that in the future."

"Of course, it’s a nice program you're working here with scientists, you're learning a lot, you're gaining basic knowledge that you're going to need in college if you are planning to purse a science career."

"Yeah because it was a good experience because I did learn new things and it’s a good thing to put on your resume and there's also a stipend so that’s another bonus."

Scientist Feedback

Introduction

The *YES!* 2012 program consisted of 24 scientists, technicians, and animal keepers who offered their time to mentor students. According to the overall scientist feedback, this year was a success in program management and reaching the target population group in terms of its demographic profile.

> "I think even going from last year…they've implemented a lot of improvements."
>
> "This year was a lot better than last year."
>
> "I'm still amazed what they did. I feel it was so well coordinated."

Below is the breakdown of mentor feedback on various aspects of the program.

Program Logistics

Each mentor had the option of participating in the orientation and mentoring seminar to prepare them for the program. Afterwards, communication with the *YES!* staff via email was the avenue of communication for problems or concerns until the program's conclusion.

Twenty of the 24 mentors participated in OP&A's exit survey of the program. They were questioned on the administration of the program. The questions were as follows:

1. *Did the YES! program administration adequately supply you with enough information? Was there clear communication between the administration and the scientists?*

   "I thought it was well organized…"

   "Elio always give info way ahead of time for me...and I got the feeling from Jennifer [mentee] she got a well rounded experience."

   "[The information they provided] Gave me a good understanding of what level he was at."

   "Initially in the beginning." "The *YES!* staff could have followed up in the middle and provided more guidance."

   "Administration could have given advanced notice and adequate prep time for trainings."

2. *Were your expectations of the program met?*

   "We get a student who was engaged and wants to learn and she was definitely engaged and willing to do whatever was asked of her."

   " Thought the two (interns) would work together, but they did not get along."

   "Yes. I suppose I forgot how young they were going to be…I can better understand their level of understanding and what they can actually do."

   "Initially had high expectations in terms of work load that could be accomplished."

   "To be engaged….interested...up for anything." "We ended up doing stuff that wasn't too demanding."

3. *Was the target demographic reached?*

   "He was what we expected - from the Latino working community."

   "It seems to focus on Hispanics more than all types of minorities and other kids."

   "Caucasians or native citizens were underrepresented."

4. *Did you feel taking on an intern prohibited you from getting your own work done and meeting deadlines?*

   "Would like to do a full day next year."

   "…9:30 to 3:30 two days a week. I would have liked to do three days a week."

   [Twice a week]"Not enough time to work on the projects we gave them." "I wish we had more office time for him."

   "Two full days is ideal because it allows for a balance between personal work and mentoring."

   "Two days...All I could do."

Relationship with Student(s)

1. *Did you have a positive relationship with your mentee?*

   “Very strong; both spoke Spanish as native tongue and had many things in common.”

   "We got along and have a similar sense of humor."

   “Awkward relationship with [mentee]. She was extremely shy and did not participate.”

   "[…] was very professional and polite."

   "…wasn't convinced they really wanted to be there…they were there because it looked like the easiest program."

   “Great relationship with interns, both girls were very motivated and talkative asking great questions.”

2. *Would you like to keep in touch or have the program conduct some type of follow up with the student?*

   "Yeah…I'd be willing to help in any way possible."

   "I'd be interested to see what my girl's doing."

   "It would be interesting to follow-up and see what from their perspective how they thought the program impacted their lives."

3. *Have you kept in touch with your mentee or any of the other interns?*

   "Yes I have followed up. I think a formal follow-up would be great."

   "She came to visit last week."

4. *Do you think the program could be scaled up to 75 or more interns?*

"Hard to say, we could probably handle more not 75. (Is the interest there?) I think it could be…the trouble is during the summer we have a lot of volunteers so we're already scheduling in other people." "I think the tricky part is they might be interested but already devoted time to teaching other people."

"Sure if you could find the people to do it."

“Yes, partially because the students were so mature they needed very little supervision. A large group could be manageable. [I don’t] know if enough scientists can take on the commitment and program should be expanded incrementally.”

“Depends on willingness of staff.” "Speaking for my department we can only take one student per year."

5. *Would you participate in the future?*

“Potentially, it takes a lot of planning to make sure the student is set up. "We are really busy this time of year."

“I'm not sure. Very time consuming, they needed constant supervision.”

Eighteen others scientist-mentors said “Yes.”

Why Become a Mentor?

When asked “why become a mentor?” most of the scientists gave one of three responses, 1. They always wanted a mentor at a young age, 2. They felt the need to give back to their community, and 3. They strongly believe that more programs should expose young people to the sciences.

"I have a deep commitment to what the program beliefs are." "I believe in giving an opportunity to kids that normally wouldn't have the chance."

"I felt the Smithsonian did me a great justice by giving me an opportunity…so I always try to give back."

How Can the Program Be Improved?

The overall sentiment for the 2012 *YES!* program was that there has been a significant improvement from the previous years in terms of reaching the target demographic, selecting mature students who are eager to learn, exposing interns to the sciences, and successfully completing intern assignments. As for areas of opportunity, *YES!* can improve in intern selection, matching students to their interests and scheduling.

Some mentors suggested that although this year was the best year so far in reaching the target demographic, the program should still strive to select more disadvantaged youths.

Mentors also believe matching students to their interests should be a priority. Many students are unable to intern in their primary interest due to department slots filling quickly. This leads to other mentor suggestions that stress spreading the word about the program so that more students may have the opportunity to work in their field of promise.

In addition, many mentors from the National Zoo felt the length of the program was insufficient. There needs to be adequate time to train (three weeks in some cases) the interns so they can comfortably function without constant supervision and benefit the department.

Mentors also suggested the following:

> "Match students more closely to their interests."
>
> "Public engagement should be a program focus."
>
> "Rotate interns to different mentors if the type of work is not their interest."
>
> "Check for interests and allergies for outdoor activities."
>
> "Allow even more underprivileged kids into the program."
>
> "[Department] could make more interesting activities for interns and facilitate unique final projects."
>
> "Full days instead of half days for the National Zoo. A minimum of 12 hours per week."
>
> "Provide mentors name badges with their student's name and give students name tags with their mentor's name."
>
> "Spread word of the program to more of the staff."

"Create more structured goals for the mentors and provide an outline for the duration of the program."

"Keep program intimate even if it scales up."

Summary

YES! had a successful year in management and administration, and has 100 percent of its mentors willing to participate in *YES!* 2013. Most feedback suggests the program work with each department to find a suitable schedule, that more interns are matched with their paramount interests, and a structured outline of expectations be handed out to the scientists.

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…

Selection Process: Students. Qualified applicants are supposed to demonstrate a genuine interest in the field of science and lack opportunities to pursue science programs in their schools or communities. However, several students told the interviewer that they had little interest in science and they participated in the program only to add cool experiences to their resume's, to get a stipend, or to find something to do during the summer, etc. One student suggested that in the future program organizers should be sure applicants really need the opportunity and the money to attend college. Three of the 2012 students had been in the program in 2011.While the selection process substantially improved before the 2012 program, staff involved in student selection need to listen carefully to the motivation for a student's wanting to join *YES!*

Selection Process Scientists: There is no formal selection process to become a *YES!* mentor. However, the program suggests that mentors be open- minded individuals who enjoy teaching and who can devote time for one-on-one mentoring. To help prepare first-time mentors *YES!* offered an instructional session and pamphlet; most mentors (first-timers) attended the session. It might be helpful to the students if *YES!* staff visited each work site during the summer, unannounced, and observed the mentor-student interactions.

Schedule: Different from 2011 and in response to suggestions, the 2012 students were divided into two separate teams A and B; each team had its unique schedule. Team A spent half day working on their projects in the museum and half day for public rotations, CMAST, and tours; while Team B had two full days for its projects at NZP and the Smithsonian Garden, and three days to join Team A for activities mentioned above. A number of students (especially students from NZP) said they didn't like public rotations because not all public rotations were fun and the students would prefer more time for their work with scientists. Some scientists recommended giving detailed maps to students so less time was given to finding their way around. We suggest a major cut-back in the time allocated to public rotations and provide a few students the option of working in some of the places that are public rotation options (e.g. Insect Zoo) full-time.

Projects: Students were not aware that they may end up with something they don't like to do for their internship; or they thought some projects were interesting but changed their minds when actually started to do that. Many suggested that NMNH should put thorough information about different projects on its website so that students could do research

before they apply for the program. Useful information includes project description, pictures, and scientists' contact information.

Partnerships: Many of the mentors who had two interns preferred it to having just one because the two were able to collaborate with each other and not need constant supervision. There was only one instance where the two interns did not get along. We suggest that *YES!* staff assign two interns to mentors who are sure they can spare the time.

Length: The majority of scientists said that they would have liked, at minimum, an additional day with their interns. Scientists claim that there needs to be more time for substantial data collection, training, and project preparation. Only three mentors felt that the time allotted was burdensome to their workload. As an improvement from the 2011 *YES!* program, students had longer time for their internship. Most students like the program length in terms of both the daily working hours and the whole program duration. But some students from NZP and MSC said they prefer one or two extra days to work on their projects. *YES!* might consider a longer program.

Attendance and Pay: Overall, mentors had no issues with attendance for 2012. Only one intern was absent without explanation for the day of presentation.

Staffing: Although there were no negative comments about students' relationship with the coordinator and interns, students said they wish interactions could have been more frequent. This leads us to suggest that *YES!* staff may want to approach students more often, start a conversation during field trips, and even set up more interactive activities with students. According to *YES!* staff, three staff persons per 25 students was adequate for the program. If this program were to be scaled up to 75 students, nine to ten staff people may need to be available unless efficiencies of size were introduced.

Program Growth: Scientists in departments that have embraced *YES!* believe that the program could be scaled up potentially to 75 students. Several scientists from these departments have been spreading the word about *YES!* and think it is a great opportunity to give back to the community. Other scientists from departments not as involved with *YES!* note that the program's growth depends heavily on the number of mentors. The biggests challenge, according to scientists, is that many potential participants do not know about the program. There was also a general notion that some scientists do not have time, or care to be bothered with the extra work an intern would need. Several scientists suggested that some of their peers would not be interested in taking on an intern.

Summary: First and foremost scientists believe *YES!* has had its best year yet in 2012. Some say they have seen improvements and believe the staff listened to some suggestions. One major improvement has been reaching the target demographic of underprivileged

minorities. Scientists have said that the *YES!* program has come closest to reaching its goal with the 2012 interns. Most of the scientists said they would recommend *YES!* to their colleagues.

Appendices

A. 2012 *YES!* Program Project List

Department	Contacts	Title(s)	Project Description	*YES!* Interns
Botany	Ida Lopez	Botanist	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. Alexandra's and Carolina's 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.	1
Collections and Archives Prog.	Deborah Hull-Walaski	Supervisory Museum Specialist	Interns will be conducting an inventory of the education collections, including identifying objects Updating and formatting records in the EMu database. EMu training will be provided. The intern will be photographing collections objects and entering photos into Emu. They will be assigning numbers to collections objects that either do not have numbers or have numbers that will no longer be used. Assisting staff with determining Public Levels of Access and Handling to the collections and Re-housing collections objects. Assigning QR code information to collections objects and attaching the QR codes to the objects themselves or to their housing materials. The interns will be transferring objects from temporary storage into the new Education Center Facility at NMNH.	1

Department of Anthropology	Joshua Bell	Anthropologist	Interns will be conducting an inventory of collections based projects. The first, The Sweetness of the Stone-Age, examines the narratives found in, and around, the dispersed collections made during the 1928 United States Department of Agriculture's Sugarcane Expedition to New Guinea. The second project, Melanesian Networks, is a survey of NMNH's Melanesian collections (New Caledonia, New Guinea, Solomon Islands and Vanatau) to tease out the professional and personal relations, and histories, found in the Smithsonian's collections.The interns will work closely to the collections.	1
Department of Entomology	Shelah Morita	Fellow, Research Collaborator, Entomology		1
Department of Mineral Science	Mike Wise	Curator	This project will attempt to answer a variety of questions regarding the origin of amazonitic feldspar from the NYF-type Morefield pegmatite. The intern will prepare feldspar samples for X-ray analysis and assist in the collection of X-ray diffraction data. The student will also assist in the collection of X-ray maps, which are used to examine the two-dimensional distribution of up to 20 chemical elements on a specimen surface.	1
Insect Zoo	Dan Babbitt	Museum Specialist		1
Laboratory of Analytical Biology	Natalia Agudelo	Technician	The intern will have the opportunity to aid extracting DNA from the tissue of the new specimens (animal tissues) received at the LAB.	1

			Depending on the amount of tissues the extractions is done manually or what is called the robot can be used. Interns will assist in quantifying the amount of DNA that was successfully extracted and help amplify the DNA through a process shortly referred to as PCR. In addition, interns will analyze DNA of tissues from all over the world, most closely with marine invertebrates (Shrimps, crabs, worms, etc.) as well as terrestrial insects, plants, and frogs from the Amazons!	
Laboratory of Analytical Biology	Niamh Redmond	Technician	The Intern will be testing DNA from some of the older museum sponge specimens to see if the 18S rDNA sequences have insertions. If so this can help us place the species in particular groups in the phylogenetic tree.The student would learn some laboratory techniques - pipetting, PCR, gel electrophoresis and general lab duties and etiquette. There would also be some work on the computer, depending on their interest and ability.	1
Mammals	Suzanne Peurach	Vertebrate Zoology	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.	2

National Zoo-African Trail	Kate Volz	Animal Keeper	Home of the fastest land mammal on earth, the cheetah and also the largest zebra species on the planet: Grevy's Zebra. While working here, the intern will get a very diverse immersion in several African hoofed stock; the South American maned wolf; and the Australian Wallaby.	1
National Zoo, Amazonia	Justin Graves	Animal Keeper, Amazonia	The intern will have the opportunity to be in a tropical rainforest environment without leaving D.C. Interns will get a unique experience working with many species of fish, amphibians, reptiles, mammals, and bird species. In addition, the intern that works here will also have 2 hours of work at the Zoo's Animal Hospital. For more information please check out the Zoo's Amazonia website: http://nationalzoo.si.edu/Animals/Amazonia/Exhibit/	1
National Zoo-Asia Trail	Juan Rodriguez	Animal Keeper, Asia Trail	One of the newest areas built at the Zoo back in 2006, Asia Trial will give the intern a broad spectrum of Asian species to work with. The intern will get hands on experience with cleaning; food preparation; some basic animal training techniques; and opportunities for public education . The intern will also have the opportunity to learn about research data collection and behavior research topics.	2
National Zoo-Bird House	Gwendolyn Cooper	Animal Keeper, Bird House	The intern will get hands on experience with cleaning, food preparation, and opportunities for public education. The widest variety of birds at the zoo live indoors at the Bird House where a series of smaller exhibits encircle a large indoor jungle complete with free-flying tropical	1
National Zoo-Reptiles	Richard Quintero	Animal Keeper,	At the Zoo's Reptile Discovery Center, you can experience the wonder and excitement of the	1

		Reptiles	reptilian and amphibian world. The intern will learn about these fascinating animals and develop a greater understanding of these unique and important species. The intern will assist Animal Keepers with daily cleaning feeding with the possibility of hands on experience working with some of the animals at RDC.	
National Zoo-Small Mammals	Rebecca Smithson	Animal Keeper, Small Mammals	The intern will get hands on experience with cleaning; food preparation; public speaking opportunities during scheduled animal demonstrations. http://nationalzoo.si.edu/Animals/SmallMammals/smhouse.cfm	1
National Zoological Park	Veronica Acosta	Veterinary Technician		1
Office of facilities, Engineering & operations	Joe Brunetti	Horticulturist	Internship with Grounds Management Operations involve manual labor; exposure to adverse weather conditions (particularly heat and humidity); and exposure to dust, dirt, and possibly some horticultural chemicals. Internships that focus on the gardens and greenhouse operations include regular horticulture maintenance duties such as planting, watering, weeding, and pruning. Special projects are typically added to an intern's regular duties so that they can practice project management skills needed to see a project through from start to finish. Projects vary greatly and are determined on an individual basis. They may include everything from record-keeping, analyzing ecosystems and researching nomenclature to turf management and public programming. The National Museum of American History,	1

			Behring Center, has the largest turf and tree area of all the Smithsonian gardens located on the National Mall. Also found on the grounds of this museum are a developing woodland and two specialty gardens of interest--the Victory Garden and the Heirloom Garden. The intern will assist SG horticulturists with maintaining the gardens and grounds and researching appropriate plantings for the specialty gardens.	
Paleobiology	Jocelyn Sessa	Museum Specialist Paleobiology	Tiffany 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. Tiffany 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. She 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 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, Tiffany will analyze body size in relation to time elapsed since the	1

			mass extinction and to the temperature data she collected, and create presentations describing the results of her research.	
Smithsonian Gardens	Tom Miranda	Orchid Specialist	SG's Greenhouse Nursery Operations manage the production facility that provides plants and related supplies necessary to meet the horticultural needs of the Smithsonian museums. Major areas of emphasis include the propagation and production of annuals and hanging baskets for the flower beds and gardens; production of tropical plants; production of poinsettias for the winter holiday season; and the management of the plant collections. Working directly with SG staff in charge of the program, the intern will assist with cultivation techniques used to produce various seasonal pot crops. This includes potting rooted cuttings, watering, weeding, fertilizing, and monitoring and controlling various diseases and pests.	2
USDA	John Brown	Research Entomologist	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 William will be one of several contributors.]	1

Vertebrate Zoology	Christopher Milensky	Museum Specialist	Interns will be asked to assist with collections management projects in the division of birds related to caring for the 600,000+ bird specimens kept in the research collections. This may involve assisting with a project curating our genetic resources, improving the storage conditions of our fluid specimens, assisting with assigning catalog numbers to skeletal specimens, or creating digital images for use in our database.	2

B. 2012 Students' Demographic Characteristics

School	Location		Number
Park View	VA		1
Patriot	VA		1
Flowers	MD		1
BSW	DC		1
T. Marshall	DC		1
Oxon Hill	MD		1
Parkdale	MD		1
Chavez	DC		1
Annedale	VA		2
Mount Vernon	VA		1
Holy Cross	MD		1
Bowie	MD		1
Yorktown	VA		1
Westlake	MD		1
E. Roosevelt	MD		1
Bell	DC		3
Coolidge	DC		1
Bannekar	DC		4
Cardozo	DC		1
		TOTAL:	**25**
Grade			
Freshmen/9th			9
Sophomore/10th			10
Junior/11th			6
Senior/12th			0
Age		**TOTAL:**	**25**
Fifteen			8
Sixteen			8
Seventeen			7
Eighteen			2
		TOTAL:	**25**
Ethnicity/Race			
Latino			13
African American			9
Asian			3
Caucasian			0
		TOTAL:	**25**

C. 2012 List of Participating Scientists' Departments/Programs

Characteristics		Number
Museum	**Department**	
NMNH	Insect Zoo	1
NMNH	Entomology	1
NMNH	Paleobiology	1
NMNH	Invertebrate Zoology	1
NMNH	Botany	1
NMNH	Mammals	2
NMNH	Collections and Archives	1
NMNH	Anthropology	1
NMNH	Engineering	1
NMNH	Mineral Science	1
NMNH	USDA	1
NZP	Bird House	1
NZP	Reptiles	1
NZP	Asia Trail	2
NZP	Africa Trail	1
NZP	Small Mammals	1
NZP	Amazonia	1
NZP	Vertebrate Zoo	2
NZP	Zoological Park	1
TOTAL		21

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

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 2012

o _____
3 hours per day
o _____
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.

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.

E. 2012 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 withthe 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.

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.

F. 2012 *YES!* Parent Packet

2012
Youth Engagement through Science
Parent Packet

Smithsonian
National Museum of Natural History

June 13, 2012

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.

Chief of On-site Learning

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

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 executed in many forms of presentation such a 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:

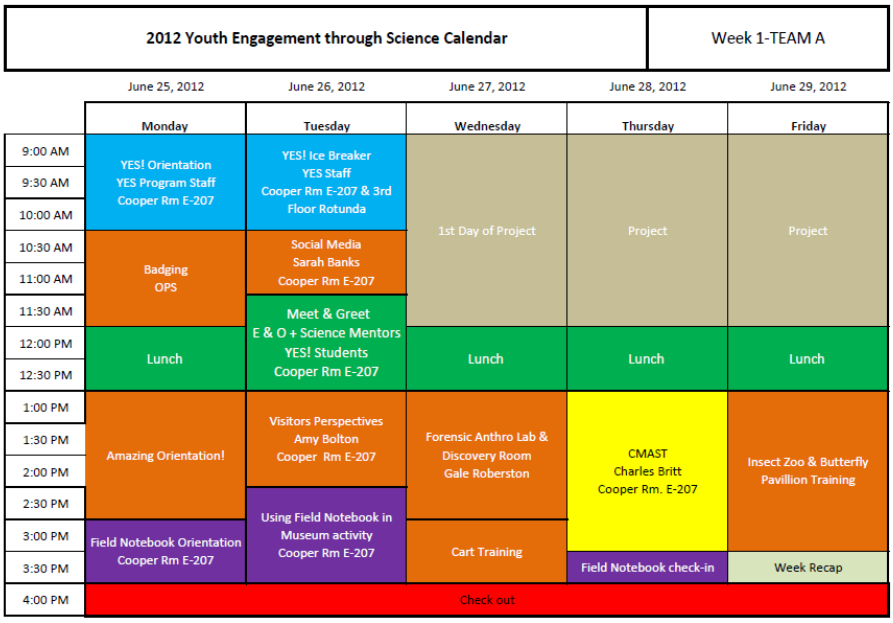
Elio Cruz
YES! Program Coordinator
Email: Cruze@si.edu
Phone: 202-633-0815/202-352-7038

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

G. 2012 *YES!* Calendar



2012 Youth Engagement through Science Calendar				Week 1-TEAM A
	June 25, 2012	June 26, 2012	June 27, 2012	June 28, 2012	June 29, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 AM	YES! Orientation YES Program Staff Cooper Rm E-207	YES! Ice Breaker YES Staff Cooper Rm E-207 & 3rd Floor Rotunda	1st Day of Project	Project	Project
9:30 AM					
10:00 AM					
10:30 AM	Badging OPS	Social Media Sarah Banks Cooper Rm E-207			
11:00 AM					
11:30 AM		Meet & Greet E & O + Science Mentors YES! Students Cooper Rm E-207			
12:00 PM	Lunch		Lunch	Lunch	Lunch
12:30 PM					
1:00 PM	Amazing Orientation!	Visitors Perspectives Amy Bolton Cooper Rm E-207	Forensic Anthro Lab & Discovery Room Gale Roberston	CMAST Charles Britt Cooper Rm. E-207	Insect Zoo & Butterfly Pavillion Training
1:30 PM					
2:00 PM					
2:30 PM		Using Field Notebook in Museum activity Cooper Rm E-207			
3:00 PM	Field Notebook Orientation Cooper Rm E-207		Cart Training		
3:30 PM				Field Notebook check-in	Week Recap
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 4-TEAM A

	July 16, 2012	July 17, 2012	July 18, 2012	July 19, 2012	July 20, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 AM	Project	Project	Project	Project	MSC TRIP
9:30 AM					
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM		Lunch	Roundtable Discussion Brown Bag Lunch CE-340		
12:30 PM					
1:00 PM	Lunch	Public Rotations		Lunch	
1:30 PM	Public Rotations		CMAST Charles Britt Kerby CE-340	Tour Feather Lab	
2:00 PM					
2:30 PM					
3:00 PM					
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 3-TEAM A

	July 9, 2012	July 10, 2012	July 11, 2012	July 12, 2012	July 13, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 AM	Project	Project	Project	Project	Zoo Trip
9:30 AM					
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM		Lunch		Lunch	
12:30 PM					
1:00 PM	Roundtable Discussion Brown Bag Lunch Cooper Rm E-207	Public Rotations	Lunch	Public Rotations	
1:30 PM			CMAST Charles Britt		
2:00 PM					
2:30 PM	Virtual Tour Library Conference Rm				
3:00 PM					
3:30 PM				Notebook review	
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar				Week 5-TEAM A
July 23, 2012	July 24, 2012	July 25, 2012	July 26, 2012	July 27, 2012
Monday	Tuesday	Wednesday	Thursday	Friday
9:00 AM	Project	Project	Project	Project	SERC TRIP
9:30 AM					
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM		Lunch	Roundtable Discussion Brown Bag Lunch CE-340	Lunch	
12:30 PM					
1:00 PM	Lunch	Public Rotations	CMAST Charles Britt Kerby CE-340	Public Rotations	
1:30 PM					
2:00 PM	Virtual Tour Library Conference Room				
2:30 PM					
3:00 PM					
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar				Week 6-TEAM A
July 30, 2012	July 31, 2012	August 1, 2012	August 2, 2012	August 3, 2012
Monday	Tuesday	Wednesday	Thursday	Friday
9:00 AM	Final Project Poster	Final Project Poster	Project	Project	Project
9:30 AM					
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM	Lunch	Lunch	Roundtable Discussion Brown Bag Lunch CE-340	Lunch	End of Summer Lunch
12:30 PM					
1:00 PM	Public Rotations	Public Rotations	CMAST Charles Britt Kerby CE-340	Public Rotations	
1:30 PM					Final Project Showcase Directors Hall
2:00 PM					
2:30 PM					
3:00 PM					
3:30 PM					Community Day Final Prep
4:00 PM	Check out				

TEAM B

2012 Youth Engagement through Science Calendar	Week 2-TEAM B

	July 2, 2012	July 3, 2012	July 4, 2012	July 5, 2012	July 6, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project	Independence Day	Project	
9:00 AM	Late Check-in				Late Check-in
9:30 AM	Public Rotations				Public Rotations
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM					Roundtable Discussion Brown Bag Lunch Kerby Rm CE-207
12:30 PM					
1:00 PM	Lunch				
1:30 PM					IZ Tour Yolanda Villacampa
2:00 PM	Diversity Training Tracey Cones Cooper Rm E-207				
2:30 PM					Paleo Tour Dave Bohaska
3:00 PM					
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 1-TEAM B

	June 25, 2012	June 26, 2012	June 27, 2012	June 28, 2012	June 29, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM			Project	Project	
9:00 AM	YES! Orientation YES Program Staff Cooper Rm E-207	YES! Ice Breaker YES Staff Cooper Rm E-207 & 3rd Floor Rotunda			Forensic Anthro Lab & Discovery Room Gale Roberston
9:30 AM					
10:00 AM					
10:30 AM	Badging OPS	Social Media Sarah Banks Cooper Rm E-207			
11:00 AM					Cart Training
11:30 AM		Meet & Greet E & O + Science Mentors YES! Students Cooper Rm E-207			
12:00 PM	Lunch				Lunch
12:30 PM					
1:00 PM	Amazing Orientation!	Visitors Perspectives Amy Bolton Cooper Rm E-207		CMAST Charles Britt Cooper Rm. E-207	Insect Zoo & Butterfly Pavillion Training
1:30 PM					
2:00 PM					
2:30 PM		Using Field Notebook in Museum activity Cooper Rm E-207			
3:00 PM	Field Notebook Orientation Cooper Rm E-207				
3:30 PM				Field Notebook check-in	Week Recap
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 3-TEAM B

	July 9, 2012	July 10, 2012	July 11, 2012	July 12, 2012	July 13, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project		Project	
9:00 AM	Late Check-in		Late Check-in		Zoo Trip
9:30 AM	Public Rotations		Public Rotations		
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM					
12:30 PM					
1:00 PM	Roundtable Discussion Brown Bag Lunch Cooper Rm E-207		Lunch		
1:30 PM			CMAST Charles Britt		
2:00 PM					
2:30 PM	Virtual Tour Library Conference Rm				
3:00 PM					
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 4-TEAM B

	July 16, 2012	July 17, 2012	July 18, 2012	July 19, 2012	July 20, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project		Project	
9:00 AM	Late Check-in		Late Check-in		MSC Trip
9:30 AM	Public Rotations		Public Rotations		
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM			Roundtable Discussion Brown Bag Lunch CE-340		
12:30 PM					
1:00 PM	Lunch				
1:30 PM			CMAST Charles Britt Kerby CE-340		
2:00 PM	Tour Featrher Lab				
2:30 PM					
3:00 PM					
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 3-TEAM B

	July 9, 2012	July 10, 2012	July 11, 2012	July 12, 2012	July 13, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project		Project	
9:00 AM	Late Check-in		Late Check-in		Zoo Trip
9:30 AM	Public Rotations		Public Rotations		
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM					
12:30 PM					
1:00 PM	Roundtable Discussion Brown Bag Lunch Cooper Rm E-207		Lunch		
1:30 PM					
2:00 PM			CMAST Charles Britt		
2:30 PM	Virtual Tour Library Conference Rm				
3:00 PM					
3:30 PM					
4:00 PM	Check out				

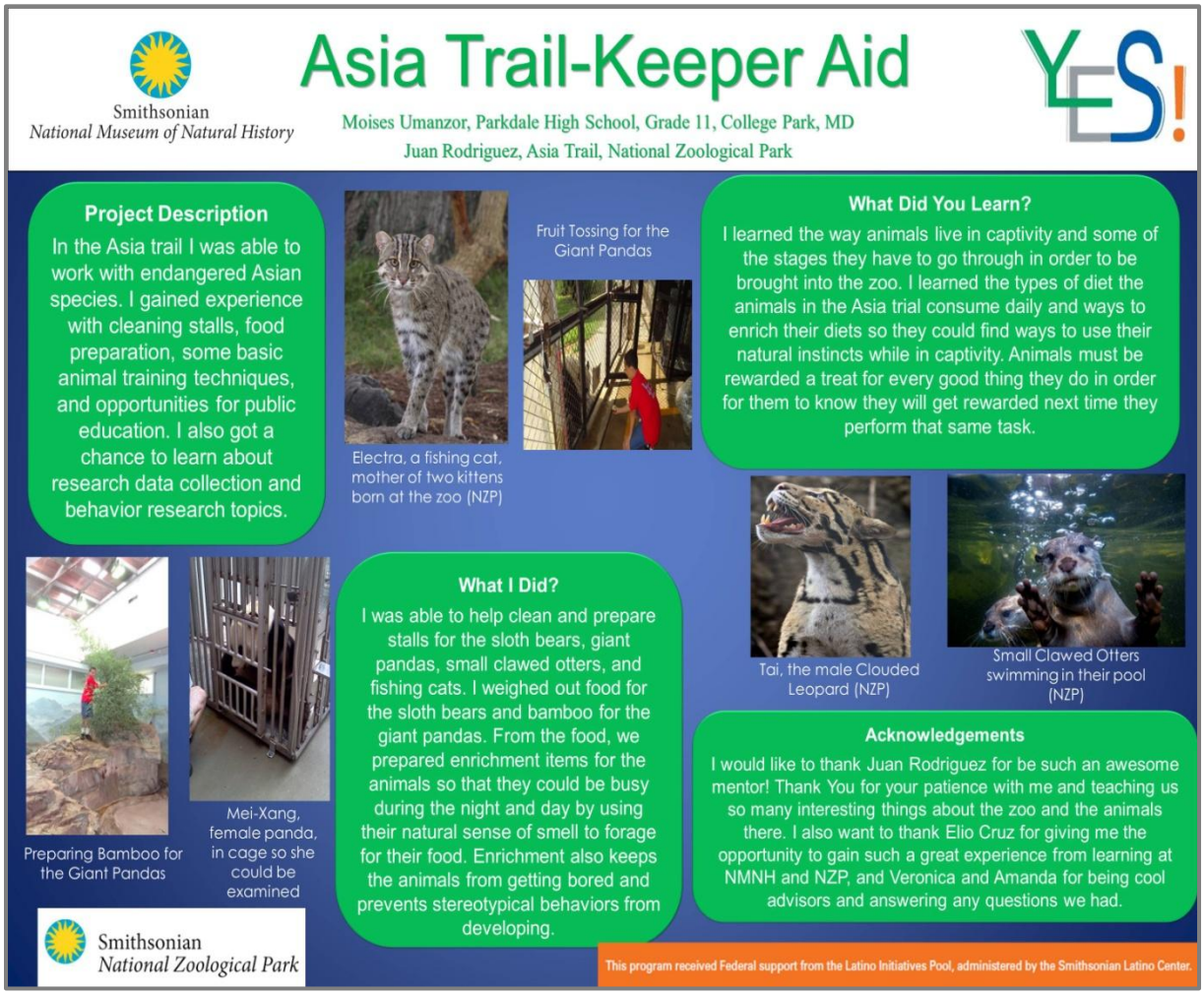
2012 Youth Engagement through Science Calendar	Week 6-TEAM B

	July 30, 2012	July 31, 2012	August 1, 2012	August 2, 2012	August 3, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project		Project	
9:00 AM	Late Check-in		Late Check-in		Late Check-in
9:30 AM	Public Rotations		Public Rotations		Public Rotations
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM	Lunch	Lunch	Roundtable Discussion Brown Bag Lunch CE-340		End of Summer Lunch
12:30 PM					
1:00 PM	Final Project Poster	Final Project Poster	CMAST Charles Britt Kerby CE-340		Final Project Showcase Directors Hall
1:30 PM					
2:00 PM					
2:30 PM					
3:00 PM					Community Day Final Prep
3:30 PM					
4:00 PM	Check out				

2012 Youth Engagement through Science Calendar	Week 5-TEAM B

	July 23, 2012	July 24, 2012	July 25, 2012	July 26, 2012	July 27, 2012
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		Project		Project	
9:00 AM	Late Check-in		Late Check-in		SERC Trip
9:30 AM	Public Rotations		Public Rotations		
10:00 AM					
10:30 AM					
11:00 AM					
11:30 AM					
12:00 PM			Roundtable Discussion Brown Bag Lunch CE-340		
12:30 PM					
1:00 PM	Lunch				
1:30 PM			CMAST Charles Britt Kerby CE-340		
2:00 PM					
2:30 PM	Virtual Tour Library Conference Room				
3:00 PM					
3:30 PM					
4:00 PM	Check out				

H. Student Posters



Smithsonian
National Museum of Natural History

Fossil Mollusks

Tiffany Munoz-Zegarra from the Academy of the Holy Cross, Grade 9, Kensington, MD
Jocelyn Sessa and Marc Laflamme, Paleobiology, NMNH

YES!

Project Description

My project this summer consisted of drilling different types of snails and clams to collect powdered samples for analyses. These samples were taken to the lab to be chemically analyzed to see the percentages of carbon dioxide (CO_2) and oxygen (O_2) found in the shells. The purpose of this project was to calculate seasonal temperature records based on the carbon dioxide and oxygen isotopes. These seasonal temperature records can help us understand global warming and ice ages in the past, and determine the ocean conditions where these animals lived some 65-45 million years ago. In addition to working with mollusks, I took pictures of the fossil exhibits in the National Museum of Natural History for teaching and outreach purposes.

Weighing Samples

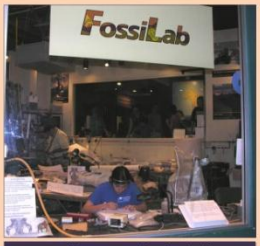
What Did I Learn?

I learned that mollusks have evolved throughout time but some still closely resemble their modern descendants. I have also learned that mollusks have been affected by climate change and some catastrophes that have happened in the past, but mollusks continue to evolve and studies about them can help us to unfold and see the seasonal temperatures from way back to 65 millions years ago. Finally, I learned how to capture scientific information through photography of exhibits.

What I Did?

For my project, I started by carefully cleaning the specimens that I worked with and took pictures of them to later label my work. I drilled them using a dental drill at a low speed, placed the powder in samples, and collected data. I also took pictures of the exhibits in the museum for teaching purposes. I started with pictures of the entire exhibit, then focused in on each individual fossil specimen.

Picture I took of *Tyrannosaurus rex*



Drilling a mollusk shell

Drilling a mollusk shell

Acknowledgements

Thank you to the NMNH, Elio Cruz and the YES! Staff for giving me this opportunity. Thank you to Jocelyn Sessa and Marc Laflamme for being amazing mentors and helping me in my project and thank you to Abby Telfer for giving me the great experience of working in the FossilLab.

This program received Federal support from the Latino Initiatives Pool, administered by the Smithsonian Latino Center.

I. 2012 OP&A *YES!* Program Interview Guides

Student Interview Guide

Interviewer:

Name of Student:

Data Interviewed:

1. Is this your first year participating in the *YES!* Program?
2. What were you expecting when you first entered the program?
3. What was your specific project and what did you learn?
4. What was your relationship like with the scientist you worked with and other staff members?
5. What was your relationship like with the other students?
6. Do you think you'll stay in touch with any of the other students after this summer?
7. What did you like about the program? What was your favorite part?
8. What did you dislike about the program? What did you find difficult?
9. What did you gain from your participation in YES? Short-term and Long-term benefits?
10. Why did you want to participate in the *YES!* Program? (real reason)
11. IF you had to decide today, would you pursue a career in science?
    a. If yes, what field? Has your YES experience impacted this decision?
    b. If no, what are your reasons?
12. How would you suggest we improve the program? How did you feel about the program length?
13. Would you recommend this program to others?

Mentor Interview Guide

Interviewer:

Name of Student:

Date Interviewed:

a. How/why you got involved in *YES!*? [New or Repeat?]

b. Did the *YES!* staff provide you with enough information about the student and what was expected of 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?

g. Do you think it could be scaled up to handle more students, e.g. 50 or 75?

h. Some of your colleagues have suggested that Y.E.S create some forms of follow-up with former participants. How does that sound to you? [If repeat mentor: Have you heard/been in contact with former students]