The Assessment of the 2013 Youth Engagement through Science Program

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ABSTRACT

The Office of Policy and Analysis (OP&A) conducted a qualitative evaluation of the 2013 YES! (Youth Engagement with Science) program at the National Museum of Natural History (NMNH) that showed another successful year and improvement over 2012. The YES! program, established in 2010, provides minorities and underprivileged high school students’ exposure to the sciences by pairing them up with a professional mentor and providing them with laboratory experience. For 2013, mentors from seven NMNH departments, the National Zoological Park, the Smithsonian Gardens, and the National Air and Space museum provided experience for 25 YES! students. An additional five students participated in an adjunct Genomic Track Program for YES! alumni.

OP&A staff and interns collected data for the evaluation by observing students’ behavior during their internship, conducting personal interviews with students, and surveying their scientist mentors. OP&A suggestions for the 2014 YES! program include preparation for first-time mentors, a cut-back in the time allocated to public rotations, tour improvement, additional information about the program on Smithsonian websites, a possible extension of the program, and continued exploration about ways to scale up the program to 75 students.
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Institutionalizing museum programs for teenagers is a challenge for all museums. Yet, introducing young people to museum and museum-related careers can be rewarding for everyone involved. Consequently, the Office of Policy and Analysis (OP&A) was especially pleased to participate in the assessment of the fourth year of the Youth Engagement through Science (YES!) program planned and implemented by the National Museum of Natural History (NMNH) Department of Education and Outreach. This report presents findings from the 2013 assessment that will form the basis for improving the program in 2014.

In OP&A, Zahava D. Doering had primary responsibility for designing the study and interview guides, coordinating the data collection and interviewing, and writing the final report. Two interns, Bridget Sandison and Taryn Ferguson, assisted with all aspects of the study, took responsibility for interviewing the YES! participants, and transcribing students’ interviews. Bridget and Taryn, together with Sarah Block, and interns Alicia Hai, and Carene Mekertichyan, spent two solid days conducting private interviews with the students. Bridget developed the survey for the scientists and drafted major report sections. Yifei Chen and Disha Gandhi, OP&A interns will interview the students at the end of the Fall program. Staff member Claire Eckert reviewed the final product. I would like to thank them all.

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INTRODUCTION

Since the summer of 2010, the National Museum of Natural History (NMNH) has welcomed a total of 71 high school students as interns of the Youth Engagement through Science (YES!) Program, providing them with a glimpse into the work of Smithsonian Institution’s research staff and its vast collections, as well as exposure to a plethora of science careers and skills. YES! is designed to provide students with an opportunity to: learn more about science careers; gain access to the Smithsonian’s many resources; and build professional skills in both communication and hands-on laboratory techniques. The program combines traditional laboratory time with a scientist or mentor and field trips, behind-the-scenes museum tours, and public engagement with NMNH’s audiences. The goal is to expose students to an array of careers in science-related fields. In both the Career Immersion and Communicating Science skills components of the program, students are encouraged to be inquisitive and ask questions of their mentors and presenters. The YES! program also provides interns with a generous stipend at the completion of the Summer session. This summer experience potentially opens opportunities to students who would otherwise have had to work at different and less rewarding summer jobs.

For the previous three programs, from 2010 to 2012, the Office of Policy and Analysis (OP&A) completed evaluations through observations of the program components and field trips, interviews with the student interns, and feedback from the scientist mentors. With evaluation results to inform the YES! process, the design of the program has been adapted, the schedule was changed to provide more time in the lab for Zoo interns, and the number of interns was increased from 15 in 2010 to 25 in 2013. In the summer of 2013, OP&A evaluated YES! as well as the Genomic Track Program, a new addition to NMNH summer offerings that provided five YES! alumni students the chance to gain more in-depth exposure to laboratory techniques, scientific research, and genomics. Including these students, a total of 12 students have returned to the YES! program for a second summer.

Overview of the YES! Program

YES! is a sixteen-week program with a six-week intensive summer internship. This past summer it took place from June 24 to August 2, 2013. As noted, the internship has two main components: 1) Career Immersion and 2) Communicating Science. The science internship is the main focus of the first component of career immersion. Throughout the 80-hour internship, students learn from experts in various scientific fields and gain hands-on experience at either the National Museum of Natural History (NMNH), the National Zoological Park (NZP), Smithsonian Gardens (Gardens), or the National Air and Space Museum (NASM). For the career immersion component, scientist mentors met with their assigned students for two full Project Days a week (Tuesdays and Thursdays). For the second component, students engaged
in interactive workshops covering oral and written communication and science research presentation skills. (See Appendix A for a description of the program’s components.)

In addition, interns spend three hours of Public Engagement time one day a week where they gain experience interacting with the public in NMNH’s exhibitions, including Mammals, Human Origins, Gems & Minerals, and Paleobiology, as well as in learning spaces such as the Insect Zoo & Butterfly Pavilion, Forensic Anthropology Lab, and Discovery Room. YES! interns also participated in weekly 2-hour roundtable discussions on the interplay of science and public policy and the scientific and public value of students’ projects. Finally, YES! interns used their newly acquired skills in communicating science at a science fair where they presented the results of the projects they worked on with their scientist mentors. This science fair-style event allows the Smithsonian community to view the interns’ YES! and Genomic Track projects and learn more about their summer experience.

**YES! Interns**

This summer, after an application process that included face-to-face interviews, the program accepted 25 interns into the YES! 2013 Program. Of those 25 interns, 9 were of Hispanic descent or origin, a demographic group which the YES! Program targets. Students were paired with scientist mentors from NMNH, NASM, SI Gardens, or NZP. In total, nine Smithsonian departments at these four units participated, hosting the following number of interns: NMNH Anthropology (1), NMNH Botany (4), NASM Center for Earth and Space (2), NMNH Entomology (2), NMNH Insect Zoo & Butterfly Pavilion (2), NMNH Mammals (3), NMNH Minerals (1), NZP National Zoo (8), and SI Gardens (2). Of the 25 students participating, one was a returning alumnus, having participated in the YES! 2012 program. Most of the students were paired up with a scientist mentor and worked closely with her or him, and a few others worked more alone with mentor supervision. During the interview process at the end of the YES! program, OP&A asked the students to discuss their experience in detail, and also explored whether students preferred to work alone or in groups. (See Appendix B for the program calendar and YES! intern schedule.)

**Evaluation Methodology**

This evaluation is primarily informed by qualitative data from exit interviews with YES! interns, supplemented by observational data collected when OP&A staff and interns attended training sessions and field trips. OP&A was able to observe Public Engagement Training in the Forensic Biology Lab, as well as the introductory Communications Training session. In addition, in order to get to know the YES! interns so that they would be comfortable discussing their experiences during the interview, OP&A interns attended YES! field trips to the National Zoo, the Smithsonian Conservation Biology Institute, and the Smithsonian Environmental Research Center. Finally, an OP&A intern attended the YES! Community Day Presentations on Friday, August 2, 2013 to see the communication component of the program in action.
Exit interviews were conducted on Monday, July 29th from 1-4pm, and on Tuesday, July 30th from 1-2:30pm. Each YES! student was allotted a twenty-minute timeslot in which to discuss his or her summer experience with the OP&A interviewers. The interview questions were designed to get both positive and negative feedback from students. The questions included: 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. (See Appendix C for the interview guide for YES! students and Appendix D for the one for the Genomic Track Program participants.)

Instead of interviewing the scientist mentors in person, this year OP&A used an online survey. It posed general questions such as how the scientists became involved; what they expected from the program and the students; whether they enjoyed their interactions with their interns; if they thought the program was meaningful; what issues they faced and how they did/would solve them; and if they would participate again. The format allowed the scientists to write responses in their own words. (See Appendix E for a copy of the survey.)

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

**STUDENT FEEDBACK**

This section presents the key themes from the student interviews, illustrated with quotes. On the whole, the discussion follows the order of the interviews (see Appendix C). The number of quotes should not be mistaken for the importance of the topic or the frequency of a theme in the interviews themselves. Rather, some topics are better illustrated with quotes, others with a summary.

**Reasons for Participation**

Many of the students were quite clear that they were attracted to the possibility of learning more about science, already a partially developed interest. Others were more pragmatic, seeing participation as a reasonable alternative to other summer options. Some admitted that it was accidental or strongly encouraged by a relevant adult. A few were attracted by the stipend.

- *I wanted to apply for this one this year anyway because I really heard about a good experience, but when I saw that they had Air and Space this year, that sealed it for me. And I was like please, please, please take me, put me in Air and Space. Again it is a field I am interested in so I really wanted to get that experience.*
Motivation to Participate

In expressing their motivation, the interns ranged from the down-to-earth reason of avoiding boredom to recognizing that the experience would feed into future planning. While this report differentiates between reasons and motivation, for the students they were quite similar.

- I didn’t want to be bored all summer.
- When I found out that there was a program to work with the museums I jumped on it. I love working with the museum and being involved with science. Everything about science.
- My reason was that I wanted a good experience and something that I could think about when I go to college, to help me decide what I want to do when I go to college.
- At first it was for the money, but my main reason, whether it was for the money or not, was to gain insight on what I wanted to be in life. Since I was working at the zoo, I wanted to know if I would like to work with animals every day, and it’s not really a problem for me.
Expectations

When OP&A asked about the students’ expectations, it was clear that most of them did not have a clear idea of what their internships would entail and expected more science than the program contained. Some indicated that they knew some concrete facts about the program and had clear expectations.

- I expected to do a lot of science-y things. I expected it would be fun, with all the tours and everything. I thought it would be cool.
- I was expecting to do more hands-on things with the science, and working in labs, and stuff like that.
- I was expecting to learn more about science, have hands-on experience in science, other than just having a tour, or someone teaching me. And building my communication skills. ... Yes they [expectations] were [met]. I’ve had a lot of hands-on experience with science.
- I thought we were going to be at the projects every day.
- I was expecting the opportunity to be able to work at a museum. I’ve always liked coming to the museum, and I’ve always wanted to have the opportunity to work here, and I finally got that opportunity through YES!.
- I thought the Zoo was five days a week but it was just two days a week. And pretty much, I thought it was going to be like a camp-like setting. At the Zoo it isn’t. But at the museum it is a camp-like setting, and I thought it would be more of an independent intern thing.

Different Than Expected

The YES! program the students encountered was different than what they expected, generally in a positive way. They were unprepared for the setting, which included the newly opened Q?rius space,¹ behind-the-scenes tours, and the encounters with the scientific staff.

- I didn’t expect we would be looking at like the behind-the-scenes at the museum.
- I thought we were going to be working in a lab, and being in a lab most of the time and just doing lab work. So I didn’t realize we would be going other places, which was really cool because I got to be exposed to really different things.
- I’m actually seeing more of what I thought I would see...more hands-on stuff...getting to talk to people that other teenagers wouldn’t get to do possibly.
- When I first entered I thought that it was going to be more based on our sub-projects. I didn’t expect the whole communications classes and the roundtable discussions.

¹ According to the NMNH website, Q?rius is a new way to connect science with everyday experiences.
Learning

Both of the settings in which the students worked – the lab and the public spaces/classrooms – provided educational experiences. Many clearly noticed their own intellectual growth.

- Zookeepers have a lot of work. It’s not just playing with the animals. You have to prep all their food, and clean multiple times a day. All of these FDA requirements that I didn’t know about, (for example) you have to check all of their food....
- I learned how to actively listen to people. I learned the steps of listening to someone and actually hearing what they are saying, and some techniques to remember things.
- We also got to talk about stereotypes and how everyone stereotypes everyone when you first see them. We learned a lot about that. And talking to someone and actually getting on their level.

Mentors

Over the course of the program, the students spent considerable time with their mentors and developed relationships with them. At the individual level, those relationships were critical for the program’s success. It is clear from the comments below that the full range – from high enthusiasm to casual interactions – characterized the student-mentor relationships. OP&A did not encounter any sense that some mentor-student pairings were totally unsuccessful. Rather, some mentors were not in the laboratory frequently, and the students felt the absences.

- It was overall pretty casual, they were very friendly, very accepting of me, taught me a lot of things, showed me around, really helped me, they were awesome! They were really great.
- He wasn’t really there, I’ve only had like three days with him, and he’s been like doing conferences and stuff like that, but he’s pretty good, he’s a good mentor.
- They were really cool.
- I LOVE my mentor. She’s amazing, she’s cool and young...well, she’s not young young...but she can relate to some stuff.
- ...they’re kind of older, so you can’t really talk to them that much.
- She could make everything better; she just brightens my mood.

Other Students

Relationships among the students also made a difference to their experience. Here, too, there was considerable variability. The overall impression is that many of these students will continue to keep in touch with each other in different ways.
I made a lot of new friends, a lot of great people. It was nice to meet people interested in the same things I was.

I’m already friends with a few on Facebook. We were talking about maybe getting together after it is all over…yeah, I might stay in touch with them.

I got along with everybody. Within the YES! program we have our own groups that we mainly hang out with, and I’m pretty satisfied with the people that I hang out with. There are a few students that I question why they are even here though.

Some of them are amazing people…I can see myself being friends with them, some going to college doing the same stuff…

Interesting…since we all come from diverse cultural backgrounds, it was interesting seeing kids from different cultures and such. I noticed a form of…they would group together, forming cliques of sorts, based on things they had in common. Some kids weren’t the nicest, they had very persistent personalities, and they liked to impose themselves on others. I felt like people would group together based on their cultural backgrounds.

**Paired with Another YES! Intern**

Another topic that has been discussed every year is whether or not students should be assigned to a mentor in pairs or individually. If the program is to grow in size, assigning multiple students to the same lab may be unavoidable. It turns out that the students were also divided on this issue. Some clearly saw the value of a peer for company, advice, and general socializing. Others preferred to work alone. Overall, there was a preference for working alone:

- I can’t really see any bad things, but you’re working [with] them, so if you have a question, they have the same one, or you’re not asking the same questions maybe, but I also like getting that one-on-one thing, where it is just like both of us…I’m not saying I don’t like sharing, but alone I get more of my questions answered, because that is something I may do when I grow up.

- I wasn’t so alone, and there were only two of us on the project. It wasn’t like I was the only one.

- It was a little scary at first, being the youngest person there. It was also kind of cool because you had direct relationships with the mentors; you were sort of forced to talk to them because you had nobody else there. But, it would’ve been nice to maybe have one other intern there…I heard from other interns at their station there were interns from other locations.

- I find it’s better to work by myself anyway.

- I think it [another intern] was helpful, because, for example, when you go to a garden it could be really big. So you would have one person on one side and one on the other side, and at the end you would come together and share the different things that we
saw. I’m actually happy that I was with another person, because I like to interact with other people and use teamwork.

**Liked the Most**

The most interesting part of the exit interviews, according to the OP&A interns, was the conversation about what the students liked most and least. Field trips were mentioned in response to both questions in most cases drawing high marks. The comments didn’t reveal, however, what made the field trips special. From observations on the trips, OP&A thought it was the sense of discovery and recognition that came from seeing special places.

- The tours were really cool because I never even knew that it was there – SCBI, the storage places for the museum collections, and the zoo, and all their extra stuff. I didn’t even know it was there. It was really cool to see everything and to be able to learn about all the different jobs that were out there that I didn’t even know existed.
- I would have to say the Zoo. And then, the behind-the-scenes part of looking through the museum and the Zoo because all this space I didn’t know existed until I had the chance to be in this program and learn about the science of what they do at the museum and the zoo.
- I really liked the field trips. I had never been to these places, and they are really fun and cool, and we got to see so many animals that I had never seen before.
- I loved the communications training because our conversations were always fun and exciting, and we got to learn something new every day. And I really liked the public engagement.
- I mostly liked the projects, some of the tours...not all of them. I liked the Museum Support Center, and the one at Front Royal. I liked that because you get to see what is behind closed doors. But when we go on tours around here...it’s like people can see this, without having to go out.
- Really I think the project days, when I was working, I got to feed the beavers personally. Working at the Zoo was one of the best experiences....there wasn’t anything that I didn’t really like.
- I liked being able to experience lots of different fields of science, because even though I may want to major in anthropology, it is still a little up in the air. I also liked that there wasn’t a lot of pressure, whereas in school if you mess up something or you make a mistake, it’s on you or you take a failing mark for it or something goes off your grade, but here if I mess up for fail or anything, it’s just...ask another question.

**Liked the Least**

While every student interviewed readily responded to a question about what they liked the most, the 2013 cohort had remarkably few complaints. The only component of the program
that received any criticism was the field trips. The criticism centered on both the locations and the way the tours were structured. Other criticisms were more a response to their own participation rather than the program.

- Some of the tours were a little bit long, and you were standing the whole time, so I’d get a little distracted, like, ow, my feet hurt. They were just a little too long; I’d get a little bored.
- I guess some of the field trips. At certain times they were boring….the collections, but that’s just me, I’d rather work with live animals. Other people like collections.
- Some of the public engagement. I’m a shy person; it took me a little bit to get out of my shell and start talking to people. I thought it would be good for me to sort of HAVE to talk to people.
- Other than a few students that I clashed with, I liked the whole program.
- I didn’t like all of the speeches, a lot of people had a lot of speeches, like if you asked a question they would run on with their speech, and then we had less time for an activity. If we had a little bit more activities, I would’ve totally liked it. But we just had a lot of talking. It was a little boring sometimes.

**Gains – Long-term and Short-term**

The OP&A team felt that the sixth week of the program was a bit early for the students to truly articulate their gains or reflect on both long-term and short-term benefits, but interviewing could not be postponed for logistical reasons. Some recognized that it was exposure to science that would serve them well; others thought the benefit was having something interesting for the summer.

- I think I gained experience, and actual exposure to working environments. In school, you just learn and you don’t put what you’re learning to any kind of use...so I thought I wanted to be a scientist, but I don’t want to be stuck in a lab, but this showed me that you don’t just have to be the person in the lab, there is so much more to science.
- Wednesdays, when the guy comes to talk to us, I feel like I gained a lot of knowledge that I can use socially, like communication-wise. And with the project stuff, I feel like I just gained experience.
- Gave me something to do on the summer, gave me a bit of direction, met a bunch of great people...a little bit of experience and made my summer really purposeful.
- I learned communication skills, how to communicate better with people, how to express your feelings...like the way you stand or the way you talk can mean a lot to the other person, and to see how interested or uninterested you are...
It really helped my public speaking skills and presentation skills, fostered my sense of patience, it taught me a bit about science, but mostly taught me skills about interacting with people.

Project Choice

The Yes! application allowed students to specify an area of interest. It appears that most interns got their first or second choice and were pleased. Those who didn’t adapted and didn’t object.

- Did you pick the Zoo? Yes, that was my top choice.
- The reptiles wasn’t actually my first choice. It was actually at the Asia Trail. It wasn’t even one of my choices, so being acclimated to reptiles and stuff really helped me because at first I didn’t like them except for turtles.

Pursue a Career in Science/Impact of YES!

Most of the 2013 interns came in with an interest in pursuing some type of science career; thus, few said that YES! motivated them to do so. However, they were ready to acknowledge that YES! was a reality check that showed them what scientists actually do, and it broadened their definitions of what science is and its many career possibilities.

- Interning at the Zoo helped me; it broadened my scope of animal sciences, I could work in conservation, I could work in animal husbandry, I could work in zoo medicine, because I was just like either I want to be a small animal vet or a food animal vet, but it really broadened my scope to the different fields in animal sciences so that had me thinking about what I really want to do.
- Yeah, it made me see what real scientists do, instead of what you see that they do. When you go to the vet’s office, you just see them take the dog’s temperature, etc., but [name of Zoo area] they are researching things every day.
- I’ve always had a big range of things I liked, and was always afraid that science wouldn’t be creative enough. But after being here...we did this thing when we went out and collected samples of flowers, and there is a creative part where you had to dry them the way that you want them to look so that it is aesthetically pretty, so I thought that was really cool...it’s not all science-y, strict, like it HAS to be like this. I wanted room for creativity, and I realized that you can have that in science. It’s not just like these are the laws, this is it.
- I look at reptiles in a different light now; they’re not like evil creatures. By helping take care of them, I built a relationship with the reptiles and stuff, which is really cool.
Room for Improvement

Each of the interns was willing to offer a suggestion for improving the YES! program. Several mentioned each of the categories listed below.

Tours

- I feel like for some of the tours, shorter times and get to see more. I feel like some of the tours we’d stand in one place for a long time. I just wanted to roam around the whole place and get to see everything. I have trouble coming up with questions. I just like to see everything and be able to say, oooh. What’s that?

Roundtable Discussion/Talks

- Some of the activities felt like school. Like during the roundtable discussions they would have people come in and make us fill out questions and all that. I guess I don’t want to be reminded of school until it starts. The learning and stuff, I had no problem with that, but it’s just the sitting around and filling out paperwork that I didn’t like.

- More activities, instead of talks. If you’re going to have a speaker come in, have us engaged, because I saw a lot of us dozing off. Side games or something, like a mind trick or something. Pretty much it was a good program.

Student Selection Process

- Pay a little bit more attention to some students. There are some questionable students in the program. That’s like, oh, you don’t really do anything. How are you in this program?

- …some I wonder why they got in, some are just here for the check. I wonder why they’re really here.

Better Monitoring

- They [mentors] should at least talk to some students and ask them how the program is going and if there are any problems. If they had done that every other week or something like that, then maybe some of the issues that people are having with each other could have been solved early on.

Change the Schedule

- Probably switch up the days, I like Mondays, Wednesdays, Fridays doing project days, and then Tuesdays & Thursdays more of public engagement. If I was able to do this... I’d like to start my week off good, and end good.
I would say work more with your project days. So instead of being here 3 times per week, and there only 2 times per week, I would switch it around so that we would get more of an idea of what we were working on. So I would switch that to have more time with my mentor.

I honestly think public engagement hours should be shortened by one hour. First hour is great, second hour is okay...Third hour...is pure....after 3 hours you don’t want to keep repeating the same things, you get tired and grumpy. I seriously think that public engagement would be much more successful if it was just 2 hours. Even if it was just more days a week, less time per block...

Length of the Program

It was a good length. It went by really fast though; it could even possibly be a little longer....but if it was a little longer though...before I applied I was like I can do 6 weeks, but for other internships, I was like 8 weeks. That’s long!

That was good because the weeks went by really fast. Like I can’t believe it’s week 6 already. It went by really fast – it wasn’t like I was counting down the days.

It’s not long enough! It’s really not long enough for the summer time. It should be more than 6 weeks, because it’s just so exciting and you don’t want to end. They should really make it longer.

Describe/Recommend to a Friend

On the whole, the YES! age group is very susceptible to peer influence and pressure and very careful about what they do – or do not do – with their peers. An important discussion area for OP&A was how the interns would describe the program to their friends and if they would recommend it. Without exception the interns indicated that they would describe YES! as a worthwhile activity and highly recommend participation.

It opens you up to meet a lot of people, see a lot of things. It opens your eyes to a new world, really. I never really got to see behind-the-scenes anywhere [before], it was really cool to do that see that. ... a lot of the internships would be work in the same place all the time, but here you can be at the museum, or the Zoo, or Air and Space, or Gardens, or do whatever you want. Bunch of different options, but you’re also connected to all these different people so you get to ask them what they’re doing. It’s great because you can focus on something you really like, but also learn about other things you’re interested in.

I would say it is a way of learning outside of school. It’s fun but it’s not school. So you’re basically getting to learn stuff that other people don’t really get to experience and know. You get to meet great people, build networking with both your mentor and friends.
o I would describe it as...I don’t know, I talk to my friends a lot about this program. I kind of think they’re a little jealous but I don’t care. I would tell them that it’s opening your eyes up to different departments of science, and it’s a lot of behind the scenes stuff which is always cool, and I tell them it’s great....

o I would tell them [that] they’ll be immersed in science. If you don’t want to learn about science just don’t come because every day you learn something new about the science field, natural history, anthropology, things like that. I would recommend it to someone who wants to be in science and is thinking about a scientific career. Not someone who [only] likes science a little bit. You have to like science to be in this program.

o Yeah, so they could gain a new perspective on science and not just learn science from what they’ve learned about in school, because all they know about is what they’ve learned from school, not outside of school.

o I would tell them that it’s really fun because you get to go behind-the-scenes with the Smithsonian, you get to work with different people from different backgrounds, you get to learn more about science...incredible opportunity.

o It’s funny because I’ve described it to so many friends and visitors and told them to apply. I would tell them that it...it’s kind of hard....the program will actually clear up what you want to do with the rest of your life, I guess? So if you go in, let’s say I’m not bent on being an entomologist, if you go in with a passion, it will either confirm your passion or it will set you on a new road. So it will help tell you where your life is going. So it can really help you clear up what you want to do, expose you to new fields. So yeah, if like you were...I don’t know, I have one friend who wants to become a petroleum engineer, I don’t know what that is but like, it will show you like if you want to work with...I don’t know if that’s a thing in the museum, but let’s say you want to become an astronomer...you want to work in the Air and Space Museum, and if you like it, you’ll become even more determined to be an astrologist, I don’t know the terminology, but if you’re not, then you won’t want to do that, and it’s good you learned that now as opposed to like when you’re 40 and it’s like why do I do this job? It will help you get a better sense of what you want to do. So if you like something, it confirms your passion, and if not it will set you on a new [path].

Genomic Track Interns

Five students participated in the Genome Career Pathway program during the summer of 2013. All were YES! alumni, having participated in one or more YES! internships in previous summers. To compare their experience in the alumni program to previous internships, OP&A interviewed all five Genome Track students at the end of the program. The Genome Career Pathway program overlapped in some respects with the programming of YES! as the Genome interns attended a few of the same field trips as the YES! interns, and also participated in presenting their project research at the completion of the program. The major differences between the YES! and the Genome Career Pathway program include that the Genome interns
were having more hands-on time in the lab and more in-depth research opportunities, as well as a different Program Coordinator.

The Genome Career Pathway interns recognized that their program, compared to YES!, was more focused on science and the laboratory experience:

- **It was a little bit more intensive. We were with our mentors longer and it was more focused. Last year it was more... I don’t want to say laid-back, because it wasn’t more laid-back... we do more work in the lab this year. We’re left to our own devices more.**

- **My first year, I was at the Zoo with the lions and tigers. And now I’m in the Genome. It’s a different field, and I get to explore a bit more than just with animal science, which is what I’m interested in. It helped me figure out what I wanted to do later. It was good to explore molecular biology.**

- **It was definitely more hands-on and more informative. It was more concentrated in that pathway. Because we did a lot of Genome tour visits, and talked about DNA and what you can do with that field of biology. So it was very focused.**

It was also clear that the Genome interns expected an experience more akin to YES! than it actually was, and it both met and exceeded expectations:

- **I didn’t know what to expect because genomics work is kind of new, so I didn’t know exactly what they did, I didn’t come in with any specific expectations. I knew that it would be similar to what I was doing last year, but I knew some things would change. I think they kept the right things the same and they changed the right things. So letting us be more on our own and more focused, I liked that. And we still kept the cooler stuff like going on field trips, meeting people, and going on tours.**

- **I was just expecting to learn something new like I did all of the previous years, so I wasn’t sure what field I would be in so it was interesting. Yeah, I knew it would be Genome stuff, but I didn’t know what we would be actually doing. I thought it would just be learning about it and stuff. I didn’t know it would be hands-on and doing it....I would say it exceeded my expectations because I didn’t expect to be like oh my gosh, I want to do microbiology and stuff like that. And the lab experience was amazing.**

The Genome interns had considerable interaction with the scientists they worked with and with other staff members. They expected to keep in touch with them, especially as they started the college process. They all felt the relationships were positive. Similarly, they felt they had good working relationships with the other students in the Genome program. Several did mention that they would have liked more interaction with the main YES! group.

- **I’d say it wasn’t too formal. She [name of scientist] was nice, and we were able to talk about stuff other than just the science.**
It’s good. She’s a good person. She’s fun. She teaches us. She motivates us. She’s helpful. We can ask her questions. We have that very intimate, friendly relationship with her.

I would say we were all relatively close, though I was in the lab much less than they [staff] were, so they all worked together. I was the only project that didn’t have a partner, but outside of that, everything was cool. For this particular project I didn’t really need a partner, so it was very independent work.

Pretty good, actually. The whole Genome group is all alumni, so we’re pretty close. Except this one guy... he’s new. We’re all friends and equally the same. We interact as much as we can with the main YES! group. When we do, we’re all happy and friendly even though we don’t get to see them as much since we have different schedules.

The only thing I disliked was the [separation between] the Genome group and the YES! group. Even though we’re in one thing, we don’t really see each other. Just maybe in the hallways. We don’t really interact.

Yeah. I mean, you see them on field trips and it’s like oh, hi. You try to integrate with them, but you don’t really talk to them, so when it’s a field trip you’re like oh, hi, I guess I’ll sit next to you. You know? It’s awkward.

The only thing is that we should get more involved with the regular YES! students. We should get together because when we were on the field trips, the YES! stayed over there and the Genomics over here. Completely separate. But we had some times where we had a lunch talking with the Director of the museum. But it was so awkward because we didn’t know them.

Not really. I liked everything. The only thing was that I thought we were going to be more in touch with the other YES! interns.

I do wish we were with the YES! program more.

These Genome students were quite clear in expressing what they liked about the alumni program and had no complaints about how it was run nor any real suggestions for improvement.

I liked that we were able to get newer experiences; we were afforded more freedom, more responsibility. We got to go on a different set of field trips so it didn’t get redundant. We got to go see new stuff, so that was cool.

I liked that it was very focused. New experiences. I thought we would just go to the same field trips, take the same classes, and stuff like that. But it wasn’t that. We got to go to the NIH and the USDA, which were really interesting. The last two years we basically did the same field trips and the same things. But this was really interesting. We had lots of talks with scientists about what they do with genomics and DNA, so it was really cool.

They gave us an article and they invited scientists the next day, so we can all talk about it. I enjoyed those talks and discussions. That was my favorite part. What really was
exciting to me was finding out what I really wanted to do. I know I’m passionate about animals and I know I want to save them. I wanted to go to troubled areas around the world where some animals might be near extinction or something like that. I just found out that is called a conservation biologist. That was good. I learned about that during one of our discussions actually.

- It was run well, very smooth. Nothing was disorganized, everything was cool. There was nothing that I disliked. No, nothing was too hard. Because the first couple weeks were lab bootcamp, where they taught us all the lab procedures. And then our mentors helped us through anything we didn’t know. They were very patient with us and didn’t give us anything we didn’t know how to do.

These handpicked interns understood their gains from the program and frequently compared it to YES!

- And just more experience working generally. Balancing my time. It was a really busy summer for me, so this helped me work on my time management skills and my scheduling and all of that.

- I got a different aspect of science, a different field of science. I was working in mammals, and now I’m working with botany and genome. That exposed me to more science. So now I’m really into molecular biology!

- Lots and lots of experience. I’m a physical science major at my school, so I’m with chemistry and physics. I didn’t go into biology, microbiology and all that. This year, it was nice to be introduced to all of that because I really had no idea.

- I’ve always known that I liked science, but I wasn’t sure of what specific branch I liked. After this experience now, I know that I like molecular biology. That’s a great thing for me because I feel like I can focus on something and learn to study that. I’m excited.

And what would the Genome interns say to their friends?

- I would say it is very fun and a very focused track. I mean, you do get to experience in ways to take the techniques you learned and apply them to other fields of science, but at the same time, you learn how to do stuff in the lab, you meet new people, and you learn new things about the world. It’s really cool.

- Yes. It’s a great experience. You also get to network... it’s the Smithsonian, you can’t get better than that. And it’s a way to meet new people. Because usually when you’re in DC you know people from DC, but this way you get to meet people from Virginia and Maryland as well.

- If you’re interested in science, you should go. If you’re not interested in science, you should go. I got a few friends from my school to apply here, so I described to them what the program would be about and it helped them. I told them it was a good way to explore not necessarily what you want to do in science, but in general. If you end up not liking it, at least you’ll know, but you still have the experience. You can put it
somewhere on your resume and that will help to get where you want to go maybe. And if you do end up liking it, it could give you a pathway to go where you need to go. The Smithsonian is a good place to start for anything, honestly. Even the people in the cafeteria, if you want to do culinary (lots of laughing ensues)! Or if you want to be in the lab, go back in the lab! I feel like it’s for everybody.

- I would describe it to be an internship, obviously. It exposes you to science. That would be one of the main things I tell them. It exposes you to science. It gives you an idea of another aspect of science. Like, I didn’t know there was such a thing as barcoding. I didn’t know that. And I would tell them you learn things every day, you get to create a relationship with your mentors, and you get to stay in touch with them.

**YES! SCIENTIST MENTORS**

This section is based on data collected from an online survey designed to elicit feedback from participating YES! Scientist Mentors. OP&A received responses from 14 out of 20 Scientist Mentors, for a 70% response rate. The online survey asked questions about the scientists’ motivations and expectations going into the program, whether they received enough information before and during the program, whether they would prefer to have one or more interns and why, what they found most meaningful and memorable, if they think the program can be scaled up, and how the program can be improved. The survey also provided room for general commentary. (See Appendix E for a copy of the questionnaire.)

**Involvement**

Of the fourteen scientists, half were recruited by the YES! Program Coordinator, while most of the rest indicated that one of their colleagues told them about it. Introducing young people to science, helping members of minority groups have a chance at science and generally helping young people were the main motivations for participation. One scientist admitted that a department chair encouraged participation.

- I firmly believe that under-represented students should have opportunities like these at NMNH available to them. The fact that there is an educational, hands-on experience available - with a stipend no less- makes the YEIS program enticing. The target students have an alternative to working at a fast-food business to make spending money for the next year.

- I want to introduce the field of horticulture to high school students. Applications to horticulture schools are dropping, rapidly. We need young people to be interested in studying horticulture. The YES! Program allows us to showoff a bit.
Comparison to Past Years

The majority (9 of 14) of the scientist respondents had previously participated in the program and they were in a position to compare 2013 to prior years. Their comments suggest that the selection process, the mentors’ interaction with the students and the activities were improved.

- I think the biggest improvement thus far was doing the student interviews in person. This allowed us to really choose the best, well-rounded students for the program at the Zoo. I believe this year was our best group of students thus far.
- The students seemed to be even more motivated than last year. I think the application/interview process has been refined to select students with more drive/interest or something because all of them seemed really great this year.
- This was a positive year. The students were interested in the project and they meshed well with each other and with us. I enjoyed participating in the interview process. I think it made a difference whom we received as students.

Mentors’ Expectations

The scientists who volunteered for the program had expectations for the students, but nothing extravagant for themselves or their research. They all wanted to give the student something to remember.

- I expected that we would spend one day a week doing something that the intern was interested in, and spend one day a week doing something that would be helpful to me.
- I expected the interns to work on a project that I defined for them, and to make some headway in noting which data would be most useful for me in my project. I expected to fairly closely oversee their activities during the time they were with me, and to make time to talk with them about how and why we do the research we do, and why it is relevant to other people/the public.
- I was expecting very little -- what I was hoping for was that the student would learn about anthropology, and barring following this path, at the very least stay interested in science.
- I wanted to have a positive experience with the students so I could share with the other staff members. I wanted them to become interested in being mentors. I wanted the students to provide information on the types of birds visiting the gardens. They accomplished that portion of the project, but gave us a lot more. They did research which will be vital in beginning an interpreter program in the bird garden.

Without exception, the mentors’ expectations were met or exceeded; none were below expectations. Of the respondents, 9 reported that the intern/mentor relationship exceeded expectations, 8 said that the quality of the YES! interns’ work exceeded expectations, and 7 that the mentor experience exceeded expectations.
**Program Management**

All of the mentors, except one, felt that they had been provided enough information about the intern and about what was expected of them as mentors. One person indicated that more information would have been useful. Attendance at the scientist mentor orientation was poor on the part of respondents, perhaps because so many had been mentors in previous years. Those who attended (5 of the 14) found the orientation helpful.

- The orientation was helpful because it allowed mentors to ask questions and discuss ideas regarding interns and relating to them.
- It was helpful to meet seasoned mentors, and to ask several questions I had (as a new mentor). My expectations for the program were clarified during the orientation.
- The orientation was helpful because it gave me insight into the general program but also revealed information about the other units who were involved.

**Student Assignments to Mentors**

As in previous years, opinion among the scientists was mixed with respect to having more than one intern in their labs. Some of them argued both for and against assigning more than one YES! intern to a lab. Among respondents, 7 had more than one student. When asked directly, half indicated that they wanted only one intern and half that two would be better.

- If I had more than one kid I would have to split my time, and I do not want to do that.
- I think having two interns is the ideal situation to form a sort of partnership between fellow YES! interns. It allows them to work independently from the mentor; gives them company from a fellow intern; and provides a team building setting. A two-member team makes it less intimidating to be out in a vast collections area, which can be very quiet and spooky.
- The main advantage is having a peer to discover the topic and discuss the project with (rather than always talking with someone who knows more about it than they do). Other advantages were motivating each other to work hard during their time with me, and being able to divide and conquer some assignments. The main disadvantage was only having one workstation for two students. However, this forced them to work together (which was good, I think), and toward the end one student brought in a personal laptop to work from home.
- The advantage was that the two interns got to collaborate on projects, and that I was able to impact more than one intern at a time. The disadvantage was sometimes finding enough for them to do. Fortunately, I had two fantastic interns who were self-starters.
- The biggest advantage would be that more kids could get into the program rather than being limited by the number of mentors. The biggest disadvantage would be that the
mentors could feel that they don’t have enough time to mentor more than one student and continue to perform their own jobs at a high level.

- The success of having two has much to do with how well they get along. My two probably won’t become life long friends, but they worked well together. If you ended up with two people that didn’t get along at all – it would be difficult. All the YES! interns I met this year seemed personable and easy to work with.

*Short-term Memories*

The scientists were asked to list what was especially meaningful or memorable to them about the experience. In general, exposing young people to all aspects of science generated enthusiasm.

- My mentees split their time doing research and outreach. I was particularly impressed that they came up with a hands-on outreach activity to share with the public based on their own research, tested it in the museum, and wrote it up in detail so I can use it in the future. This was a great (and unexpected) synthesis of the various skills they learned during the mentorship, and was essentially of their own volition (supported by myself and the outreach mentor).

- I really enjoyed taking the students out in the field and doing some collection work. The hot, steamy day made them realize that working in the field is not for everyone.

- Seeing the student delight in animal contact and the hands-on experience of working in a zoo. Having them appreciate talking to a professional about the field.

- One of the students admitted that she first thought bird watching was boring. After the project she said her family had started to ask her about the birds they encountered while outside. She was thrilled when she could tell them a bit about the birds. I also enjoyed listening to the conversation about colleges that occurred between our college interns and the YES! students. The YES! students were grateful for the information.

- Seeing the excitement on the students face when they first meet the animals under my care.

*Most Memorable*

Among the thoughts the scientists had in response to being asked about what was most memorable were intern excitement and knowing that a difference was made in the life of a young person.

- Giving the final OK on the poster draft. The final poster presentation weighed heavy on them; it was when I sent the files for printing that I could hear the big sigh of relief from them that I realized this. They said they did too much in the six weeks to fit into one poster.
- Seeing an intern really get excited about some museum object, or natural history artifact.
- Just knowing that I made a difference in someone’s life and getting to know a really nice young person.
- Both students were very expressive in their appreciation for having the YES! experience, which made me feel like they got at least as much out of it as I did.
- Watching the students present their posters to the visitors. Sensing their excitement on relaying the information they learned in the project.

**Least Memorable**

For the most part, scientists had nothing to say in response to a question about what was least memorable. The comments they made related to time.

- Not enough days here in a week.
- I would have liked to have more information about their schedules.

**Repeat Participation**

Of the dozen scientists who answered this question, all but one indicated that they would participate again in the YES! program. Two of them added a qualification that they would need to have time available to participate, while one indicated that participation was contingent on being assigned one (instead of two) interns.

**Scaling up YES!**

An ongoing conversation at NMNH is the feasibility of scaling the program up. In general, the scientists believed that it could be scaled up, but that it requires mentors. In some instances, they felt that it’s either better as a small program or that there are mitigating circumstances (e.g., availability of undergraduate students, zoo age restrictions) that prevent growing YES!.

- I think the program can be scaled up. More staff members now know about the program. A couple of staffers have already mentioned that they will look into the program and plan to submit an intern project
- This was the first time we had YES! interns in our museum, and I’m not sure there would be enough additional interest in mentoring to scale up the program here (I think this is because undergraduate summer interns are commonly brought in, and can get more research done, full-time over 10 weeks, so it is more useful for developing projects).
As long as we retain the number of mentors, or gain a few more, I think we could handle it. There are age restrictions at certain areas in the zoo, so that limits us somewhat.

I don't have any idea – depends on how many other Smithsonian staff are willing to participate.

As long as there are mentors to handle them. I wouldn't suggest growing the program too fast.

**Grading the Experience and Possible Improvements**

Scientists who graded their experience in YES! – and particularly those more likely to respond to the survey – gave it very high marks. Of the eight who gave grades, the lowest was a B+, the rest between A- and A+. Along with high marks came minimal comments about improvement.

- Being new to it this year, I am not sure.
- I think the program was well managed this year.
- More information from program.
- I can't think of anything. This year was a big improvement over last year's experience.
- It's pretty darn great as it is in my opinion.
- I think this year was stellar, I have no real improvements to make.

**General Comments**

- Introducing a minimal dress code helped this year. After hearing comments from participants at Congressional Night, I suggest that future interns be given a code of conduct to follow while in the public. Several volunteers at Congressional Night complained to me that when there was a lull during that event, many of the YES! interns would start yelling across the rooms to each other and being a distraction to visitors. Cheering may be great at a high school event, but these interns represent the Smithsonian during their public obligations.

- I really want to be part of the interview process again next year – so very helpful!

- I very much enjoyed participating in the YES! program. I enjoyed introducing students to research, and enjoyed hearing about the outreach activities they did as well. I also got to work with two great, motivated students, which made guiding them in the research easier and faster than I expected. The only reason I will likely not participate next year is because at this stage in my career (postdoc), it is very important to advance my own research and publish completed projects, and I'm not sure the YES! experience fits into those goals (whereas mentoring undergraduates, who can accomplish more during a summer internship, does). Thanks for including me in the program this year, and I'm
happy to be involved in some more minor way in the future! I think it’s a great, motivating, inspiring program, and was impressed by the students' presentations at the end.

CONCLUSIONS AND OBSERVATIONS

At the end of its fourth year, it is apparent to OP&A that the YES! program staff has addressed most of its operational issues. By looking at the feedback from both students and scientists, as well as our own observations, the concerns about the current program are minor. These are discussed below, followed by addressing the most serious issue: increasing the size of the program to accommodate more students.

Selection Process

Students. Qualified applicants are supposed to demonstrate a genuine interest in the field of science and to lack opportunities to pursue science programs in their schools or communities. However, several students told the interviewers that they had little interest in science and they participated in the program only to add cool experiences to their resumes, 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. Several students had been in the program in 2012. While the selection process substantially improved before the 2013 program, staff involved in student selection need to listen carefully to the motivation for a student’s wanting to join YES!

Scientists. There is no formal selection process to become a YES! mentor. However, the program staff and literature suggest 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 2012 and in response to suggestions, in 2013 two full days a week were allocated to lab/project work. We suggest another cutback in the time allocated to public rotations and other non-laboratory activities to two days and an increase in lab/project time. There may also be students who would prefer full-time lab work. Put another way, it is our belief, based on comments and observation, that the schedule needs additional modifications.
**Length**

The majority of scientists said that they would have liked, at a 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 a longer time for their internship. Most students like the program length in terms of both the daily working hours and the duration of the whole program duration. But some students from NZP and MSC said they preferred to have one or two extra days to work on their projects. YES! might consider a longer program.

**Projects**

Students were not fully aware that they may not end up with what they selected to do for their internship, or they thought some projects were interesting but changed their minds once they started. NMNH should consider providing detailed information about specific projects on its website so that students could research them before they apply for the program. Useful information includes project description, pictures, and scientists’ contact information. Alternatively, mentors could make presentations during the initial meeting with parents and students about their work, and assignments could be made later.

**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 did not need constant supervision. Others objected. There was, as in 2012, only one instance where the two interns did not get along. We suggest that YES! staff assigns two interns to mentors who are sure they can spare the time and have been mentors previously. First-time mentors should be assigned only one mentee.

**Attendance and Pay**

Overall, mentors had no issues with attendance for 2012. Only one intern was absent without an explanation for the day of the presentations.

**Staffing**

Although there were no negative comments about students’ relationship with the coordinator and interns, students said they wished the 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! noted that the program’s growth depends heavily on the number of mentors. The biggest 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, the scientists believed that YES! had its best year yet in 2013. Scientist mentors who had participated previously said they saw improvements and believed the staff listened to some suggestions. One major improvement was increasing the target demographic of underprivileged minorities. Scientists said that the YES! program came closest to reaching its goal with the 2013 interns. Most of the scientists would recommend YES! to their colleagues.
Program Components

Youth Engagement through Science (YES!) is a 16-week program:

1. Six-week Summer internship – Monday – Friday, June 24th to August 2nd, 2013

2. Ten-week Fall College Preparatory Program – Saturdays, September 14th to November 16th, 2013

Summer Program Components

Component 1: Career Immersion

Science Internship. Through an 80-contact-hour internship, students learn the skills of performing research and understanding the context for their work from experts. Each intern will work on an individual project with a Smithsonian scientist-mentor at the National Museum of Natural History, the National Zoological Park, Smithsonian Gardens, and the National Air and Space Museum.

Behind-the-Scenes Tours, Field Trips, and Guest Speakers. As part of the YES! program, interns experience the vast scope of the Smithsonian Institution during field trips to some of the Institution’s museums and research centers in the area. In addition, guest speakers from our science community talk with our students about their work in their respective fields.

Component 2: Communicating Science

Community Leadership is key to sustaining students’ interest in their work and to sustaining relationships between students, their communities, and the Smithsonian. Interns engage in interactive workshops covering various skills, including oral and written communication and research presentation. Participants are provided with guidelines and opportunities to communicate and make presentations as real-world professionals.

Communicating Science to Public Audiences: Interns work with the Museum’s Education and Outreach staff and volunteers to learn how science is communicated to the public. Interns engage in hands-on experiences in NMNH’s exhibits, including Mammals, Human Origins, Gems & Minerals, and Paleobiology, as well as learning spaces such as the Insect Zoo & Butterfly Pavilion, Forensic Anthropology Lab, and Discovery Room.

Broader Social Impacts Roundtable: Roundtables are weekly 2-hour discussions on the
interplay of science and public policy and the relevance of students’ projects for scientific and public value.

**Cross-Cultural Communication Experience**: Interns will receive training in cross-cultural communication and then practice what they have learned with rotations in the exhibit halls as volunteers working with museum visitors.

**Community Day**: During the last week of the summer program, the interns use their newly acquired skills in communicating science to present the results of the projects they worked on with their scientist–mentors. This science fair-style event allows the Smithsonian community to view the students projects and learn more about their summer experience.

**Fall Program Components**

**Component 1: College Preparation.** During the fall, students participate in college preparation activities:

**Practical College Preparation Course**: NMNH collaborates with the Center for Minority Advancement in Science and Technology (CMAST), a community-based college preparation provider. Students improve reading, writing, and mathematical skills. Workshop topics include preparation for entrance exams, selecting a college or university, selecting a major, financial aid, and writing college-entrance essays.

**College Visits**: On two Saturdays, students visit colleges in the Washington, DC, area to talk with admissions counselors, meet current students, and explore campuses.

**Component 2: Community Leadership and Engagement.** For Community Leadership and Engagement, participants can become ambassadors through one of two tracks below:

**Scientific Research**: Leading Peers in Citizen Research. Interns will design and lead a workshop for their peers to access NMNH collections onsite or digitally to explore research questions related to core natural history content and skills.

**Science Communication**: Interns will research and design a conversation about current science relevant to their lives, their futures, and the future of the Earth, and delivering it via distance learning technology to classrooms across the country.
# APPENDIX B: TYPICAL WEEKLY SCHEDULE

## Calendar-Week 4

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td>Late Arrival Check-in G2 BIUS Studio</td>
<td>Poster Board Introduction Cooper Rm E-207</td>
<td>Roundtable Discussion Cooper Rm E-207</td>
<td>Project Day</td>
<td>Museum Support Center Suitland, MD</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Mineral Science (Cari Corigan)</td>
<td></td>
<td></td>
<td>Project Day</td>
<td></td>
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<tr>
<td>10:00 AM</td>
<td>Invertebrate Zoology (Linda Cole)</td>
<td></td>
<td></td>
<td>Project Day</td>
<td></td>
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End of Day
APPENDIX C: YES! STUDENT INTERVIEW GUIDE

Hi [interviewee name], will be recording this conversation for my own notes, and the files will not be shared. Your responses will remain anonymous. Please give us your honest opinion and thoughts about the program and your experience. Okay?

1. IS THIS YOUR FIRST YEAR PARTICIPATING IN THE YES! PROGRAM?  
   FOLLOW UP: If NO, how was this year different from the last time?

2. WHAT WERE YOU EXPECTING WHEN YOU FIRST ENTERED THE PROGRAM? Were your expectations met?

3. WHAT WAS YOUR SPECIFIC PROJECT? What did you learn from the project?

4. WHAT WAS YOUR RELATIONSHIP LIKE WITH THE SCIENTIST YOU WORKED WITH AND OTHER STAFF MEMBERS? Do you think you’ll stay in touch with them?

5. WERE YOU PAIRED UP WITH ANOTHER YES! INTERN FOR YOUR PROJECT?  
   FOLLOW UP: If YES, what was that like? >> If NO, what was it like working on your own?

6. WHAT WAS YOUR RELATIONSHIP LIKE WITH THE OTHER STUDENTS? Do you think you’ll stay in touch with any of the other students?

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? What are the Short-term benefits and Long-term benefits?

10. WHY DID YOU WANT TO PARTICIPATE IN THE YES! PROGRAM? (Give real reason…)

11. IF YOU HAD TO DECIDE TODAY, WOULD YOU PURSUE A CAREER IN SCIENCE?  
   FOLLOW UP: If YES, in what field? Has YES! impacted this decision? >> If NO, for what reasons?

12. HOW WOULD YOU SUGGEST WE IMPROVE THE PROGRAM? How did you feel about the program length?

13. HOW WOULD YOU DESCRIBE THIS PROGRAM TO A FRIEND? Would you recommend this program to a friend? Why, or why not?
1. IN WHAT WAYS WAS THE ALUMNI PROGRAM DIFFERENT FROM YOUR PREVIOUS EXPERIENCE WITH THE YES! PROGRAM?

2. WHAT WERE YOU EXPECTING WHEN YOU FIRST ENTERED THE PROGRAM THIS SUMMER? Were your expectations met?

3. WHAT WAS YOUR SPECIFIC PROJECT? What did you learn from the project?

4. WHAT WAS YOUR RELATIONSHIP LIKE WITH THE SCIENTIST YOU WORKED WITH AND OTHER STAFF MEMBERS? Do you think you’ll stay in touch with them?

5. WHAT WAS YOUR RELATIONSHIP LIKE WITH THE OTHER ALUMNI STUDENTS? Do you think you’ll stay in touch with any of the other students?

6. WHAT DID YOU LIKE ABOUT THE ALUMNI PROGRAM? What was your favorite part?

7. WHAT DID YOU DISLIKE ABOUT THE ALUMNI PROGRAM? What did you find difficult?

8. WHAT DID YOU GAIN FROM YOUR PARTICIPATION IN THE PROGRAM THIS SUMMER? What are the Short-term benefits and Long-term benefits?

9. WHY DID YOU WANT TO PARTICIPATE IN THE PROGRAM? (Give real reason...)

10. IF YOU HAD TO DECIDE TODAY, WOULD YOU PURSUE A CAREER IN SCIENCE? FOLLOW UP: If YES, in what field? Has YES! Impacted this decision? >> If NO, for what reasons?

11. HOW WOULD YOU SUGGEST WE IMPROVE THE ALUMNI PROGRAM? How did you feel about the program length?

12. HOW WOULD YOU DESCRIBE THIS PROGRAM TO A FRIEND? Would you recommend this program to a friend? Why, or why not?
APPENDIX E: SCIENTIST/MENTOR SURVEY (QUALTRICS ONLINE SURVEY)

1. HOW did you first get involved with the YES! Program?

2. WHY did you decide to participate in the YES! program?

3. Please mark the OTHER years you have participated in the YES! Program (Mark All That Apply):
   - Answer
     - This is my 1st year
     - 2010
     - 2011
     - 2012

4. How was this year different from previous years? (Was your interaction with the YES! Intern different? Or did you have a different overall experience with the program?)

5. What were your expectations upon entering the YES! Program this summer? (i.e. What the YES! Intern would do for you, AND what was expected of you.)

6. Were your expectations met? (Mark all that apply)

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<thead>
<tr>
<th>Question</th>
<th>...not at all what I expected</th>
<th>...below my expectations</th>
<th>...what I expected</th>
<th>...exceeded my expectations</th>
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<tr>
<td>The intern/mentor relationship was...</td>
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<td>The YES! Intern's quality of work was...</td>
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<td>My experience as a mentor was...</td>
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7. Did the YES! staff provide you with enough information about:
   A) The intern(s) you were working with?
   B) What was expected of you as a mentor?
8. Did you attend the scientist mentor orientation at the beginning of the program?

Answer

Yes
No
No, I didn't know about it

IF YES to 8, THEN 9. Was the orientation helpful for you? Why or why not?

10. Did you have more than one YES! Intern assigned to you?

11. What do you see as the advantages and disadvantages of each mentor having more than one YES! Intern?

12. How many YES! Interns would you prefer to have?

Answer

ONE
TWO
Other

13. What is especially memorable or meaningful to you about your experience with the YES! Program?

14. What was MOST memorable or meaningful?

15. What was LEAST memorable or meaningful?

16. If asked, will you participate in the YES! Program next year?

Answer

Yes
No
Maybe, if the following changed...

17. This year there were 25 YES! Interns. Do you think the program could be scaled up to handle more YES! Interns/students (e.g. 50 or 75)? Why or why not?

18. Use the blue bar (moves up and down) to grade YOUR experience with the YES! program.

Answer

F, D-, D+, C-, C, C+, B-, B, B+, A-, A, A+

19. How can the YES! program be improved?

20. The space below is for additional general comments: