Eight-Legged Educators: Exploiting the Enigmatic Nature of Arachnids

Evaluation Progress Report
Year 2 Fall 2013 to Spring 2014

Prepared:
Summer 2014

The contents of this report conform to our highest standards for data collection and reporting. If you should have any questions or concerns regarding the information reported within, please contact us

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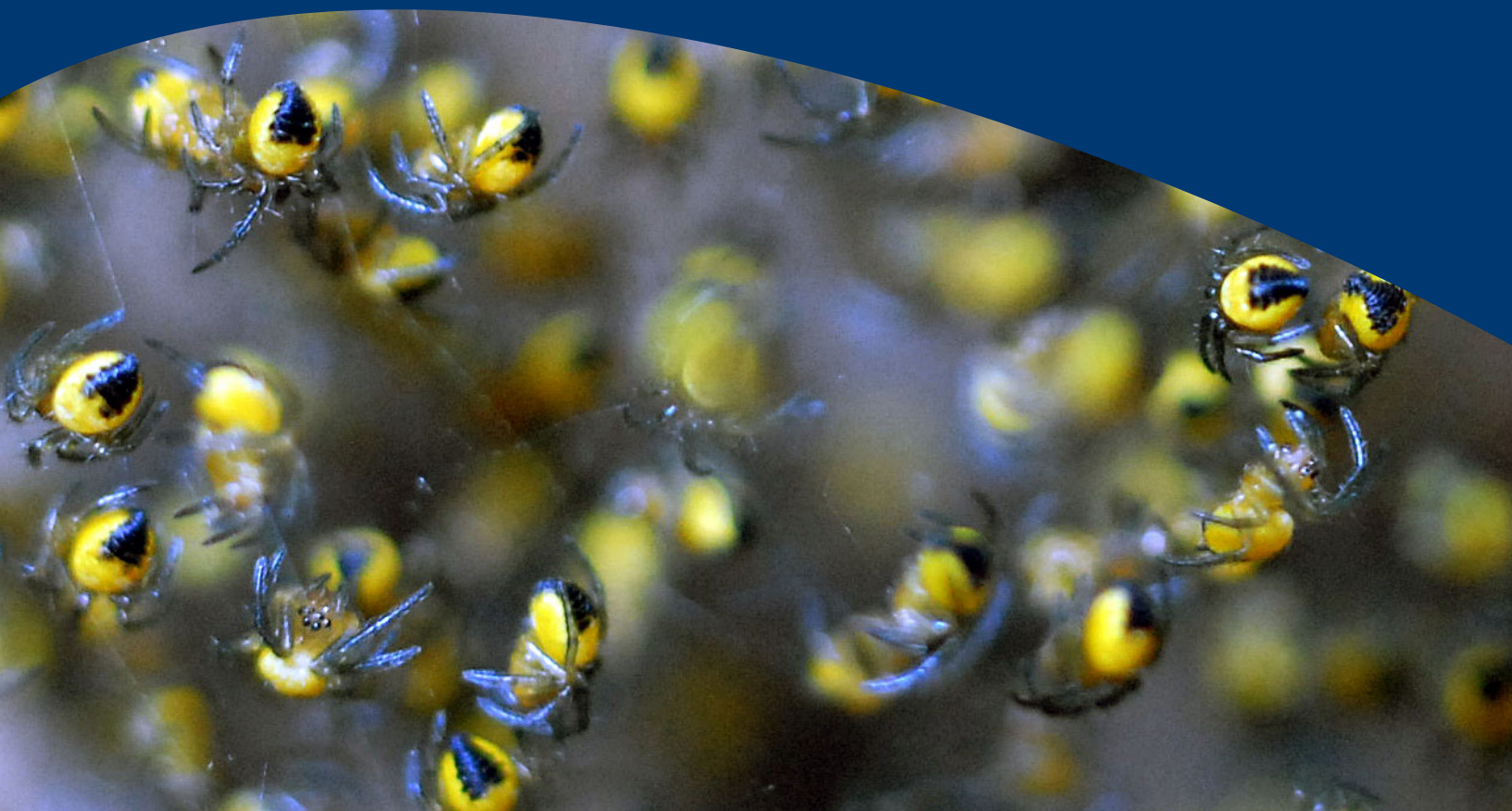

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Introduction

Program Description

Eight-Legged Educators: Exploiting the Enigmatic Nature of Arachnids, a project funded by the National Science Foundation, utilizes arachnids as a hook to draw public interest towards science. Three main programs within the project work to achieve this aim: (1) an event at a museum entitled Eight-Legged Encounters, (2) a university seminar class teaching biology students about science communication and outreach, and (3) an after school club for middle school aged youth, taught by the seminar students.

Purpose of Evaluation

The Eight-Legged Educators project includes an evaluation conducted by the Bureau of Sociological Research (BOSR). The purpose of the evaluation is to assess the strengths and weaknesses of the current program structures to allow for improvement over the course of the grant and to examine the impact of the project. The goals of this evaluation are to measure: (1) the impact of the Eight-Legged Encounters event on the general public's interest in science, (2) the impact of an after school science club on the youths' interest in, knowledge of, and future career aspirations related to science, (3) the university students' knowledge of and interest in science outreach, and (4) the effectiveness of the university seminar class in preparing students to do science outreach.

Methods

The data collection for the Eight-Legged Educators evaluation involved three audiences: a post-event survey completed by participants at the Eight-Legged Encounters event, a club experience survey completed by students in an after school club, and focus groups, observations, and end-of-course evaluations conducted with students in the BIOS 497/897 "Communicating Science Through Outreach" seminar class at the University of Nebraska-Lincoln (UNL). Year two data collection was completed from September 2013 through March 2014. The following sections describe the details of those data collection pieces.

Eight-Legged Encounters Exit Survey

The second Eight-Legged Encounters event was held on March 16, 2014 also at the Nebraska State Museum. Similar to the event the year prior, the program administrators hosted an event comprised of many different activities about arachnids presented at a level appropriate for youth. When leaving the event, one randomly selected adult attendee per group was asked if they would complete a survey about their experience at the event. Adults with children were also asked to provide consent for one of their randomly selected children to participate. For both the children and the adults, the next birthday method was used to randomly select participants. At the end of the event, all volunteers were asked to complete a survey about their experiences at the

event. Of 816 total attendees, 66 adults, 42 youth, and 47 volunteers completed the respective surveys. (Copies of each survey can be found in Appendix A).

After School Science Club Survey

As part of the seminar class during year two, UNL students lead after school science clubs with middle school students and were given latitude in choosing a theme and activities for their club. UNL students divided into two groups to lead two clubs during year two. The UNL students were also learning the evaluation process within their seminar class, so to apply this learning, the UNL students worked together with BOSR staff to create a survey to use with their middle school students. For the pre-club survey, UNL students were provided six questions to which they added their own set of questions, specific to their club curriculum. To create the post-survey, the UNL students added questions to a set of ten questions that were provided by BOSR staff. The pre-surveys were administered by UNL students on the first day of their afternoon club and the post-surveys were administered on the last day. In total, 19 middle school participants completed the pre-club survey and 14 completed the post-club survey. Copies of the surveys can be found in Appendix B.

Data Collection with Seminar Students

In the fall of 2013, five upper level undergraduate students and graduate students participated in the BIOS 497/897 “Communicating Science Through Outreach” class. These students participated in their own evaluation of their clubs by collecting the pre- and post-club data included in the report. Additionally, the students participated in a focus group, conducted by BOSR staff on November 25, 2014 (Appendix C), and they completed course evaluations on their last day of class, December 11, 2014. The course evaluations, designed by the biology department, contain both closed and open-ended questions (Appendix F).

Findings

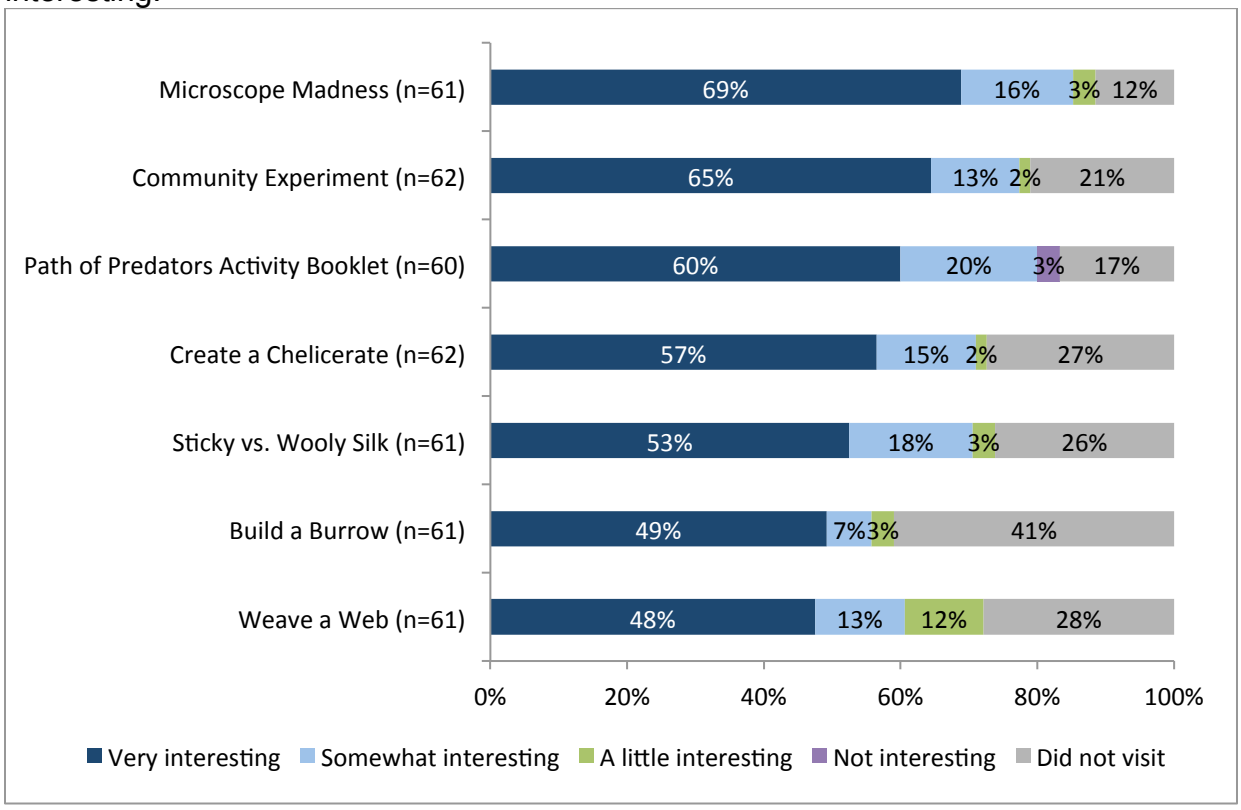
Eight-Legged Encounters Event

Adult Survey

The second Eight-Legged Encounters Event was structured very similarly to the first one with a variety of exhibits displayed throughout the museum. Among those who completed the adult exit survey, slightly over half (54%) were female and 40% were between the ages of 35-44. Respondents reported becoming award of the event from a variety of mediums, with the museum website being the most common (reported by 17%), followed by newspaper (14%), and UNL email (12%). Interestingly, 11% were unaware that the event was happening.

Like the first event in year one, the majority of adult respondents found all the events to be either very or somewhat interesting and the ranking of popularity remained similar. The most popular events, "Microscope Madness" (68.9% very interesting) and "Community Experiment" (64.5% very interesting) were found to be very interesting by over six in ten respondents. "Weave a Web" (47.5% very interesting) and "Build a Burrow" (49.2% very interesting) were the two least popular stations; however, each had nearly half of the respondents indicating that they found them to be very interesting. In addition, they were the two least visited stations, with 27.9% of respondents failing to visit "Weave a Web" and 41.0% missing "Build a Burrow".

Figure 1: Proportion of exit survey adult respondents reporting each station as interesting.



In addition to gauging the interest and success of the various stations, the adult survey also served to measure the impact of the event upon attendees' general interest and knowledge of science. The vast majority of respondents reported being either more likely (42.2%) or much more likely (37.5%) to attend another similar event after experiencing the Eight-Legged Encounters Event (Figure 2). Figure 2 also shows that the majority of respondents indicated a positive change on targeted outcomes ("kill a spider in your house" is a reverse-coded item) after attending the event. The majority reported an increase in their likelihood to take time to observe a spider or other arachnid, with 73% reporting being more likely or much more likely to do this. Over half (59%) reported an increase in understanding of the scientific process and an increased likelihood that they will read about arachnids in the future. Half (51%) indicated that they are more likely to set up their own experiment at home after attending the event. Attendees also reported a decrease in the likelihood that they would kill a spider in their house, with 58% reporting that they would be less likely or much less likely to do so. Finally, among adult respondents, 10% indicated that they are much more likely to consider a future job in science, while only 2% reported that they were much less likely to do so (the remaining were not impacted on their future career considerations).

Figure 2: Change in likelihood of adult respondents participating in the following activities.

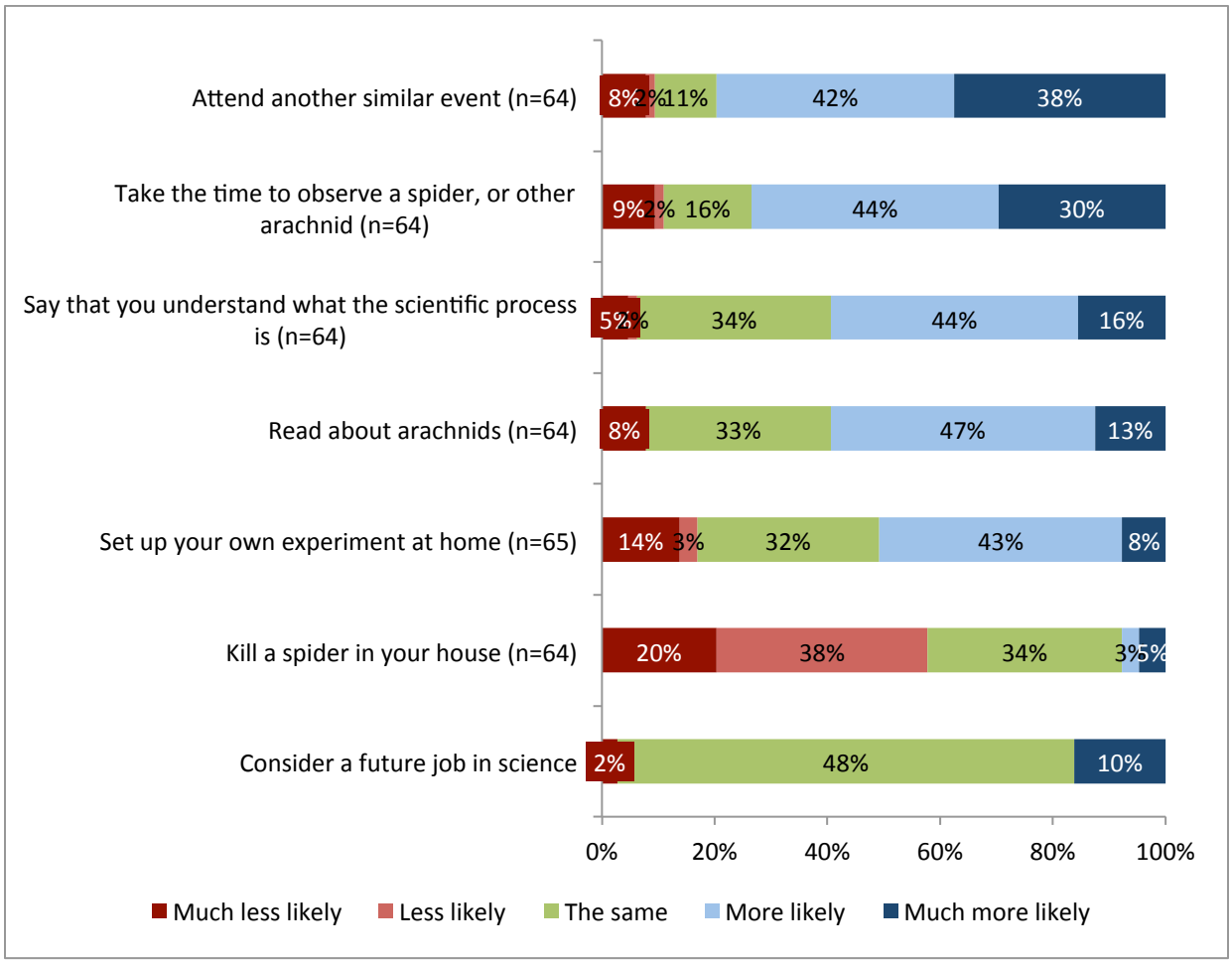
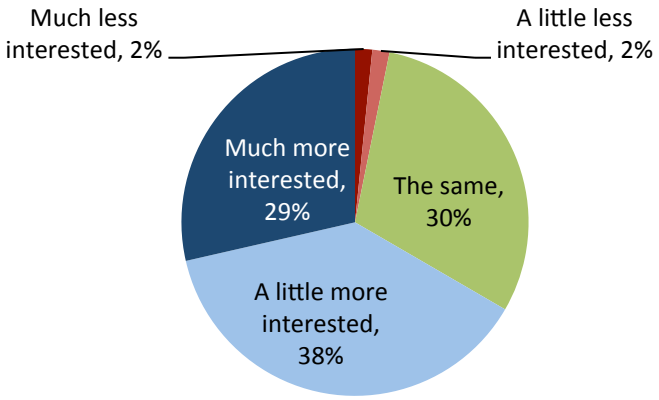


Figure 3 shows that the majority of respondents reported that they are more interested in learning about scientific discoveries after attending the event, with 38% being a little more interested and 29% being much more interested.

Figure 3: Change in interest in learning about scientific discoveries among adult respondents (N=63).



When adult respondents were asked what surprised them about the event, they generally had positive comments about the organization of the event, the hands-on nature of the event, the assortment of activities, as well as new scientific knowledge:

> *"How well it was put together"*
>
> *"The organizers did a fantastic job! This was by far the best Sunday with a Scientist we have ever attended. My kids want to come back to Morrill Hall next weekend."*
>
> *"Spiders/insects are not as poisonous as I thought making them less intimidating."*
>
> *"Learning how to identify the different spiders"*

Nearly all respondents (94%) reported learning something new. When asked to describe what they learned, they primarily described a learned fact about arachnids. Some examples include:

> "*Scorpions can glow"*
>
> *"Daddy long legs are not venomous,"*
>
> *"That most spiders don't see well."*

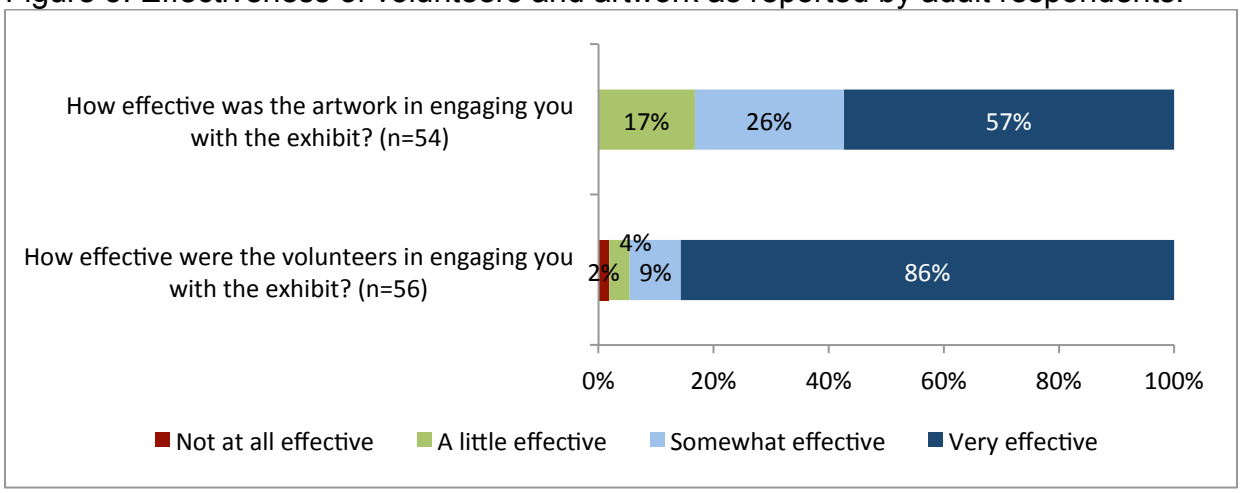
The hands-on nature of the event, getting kids involved in science, and having family time together were most often mentioned when asked what was most meaningful from the event:

> *"Getting my children excited about things they would not normally care about"*
>
> *"The kids are interested in the scientific process"*
>
> *"Family time in a productive educational manner."*

Figure 5 shows that the artwork was well received by participants, with 57% reporting that It was very effective in engaging them with the exhibit. The volunteers were also well received. The vast majority (86%) indicated that the volunteers were very effective in engaging them with the exhibit. Moreover, respondents qualitatively offered positive comments about the volunteers:

> *"I think they all did a great job!"*
>
> *"They did a great job helping everyone"*
>
> *"They were so enthusiastic. They were perfect."*

Figure 5: Effectiveness of volunteers and artwork as reported by adult respondents.



Reporting what they liked best about the event, respondents most often mentioned the variety of activities, the interaction with their children, the volunteers, and specific exhibits, with the experiment being specified most. Some specific comments include:

> "*Hands on activities and one on one interaction"*
>
> *"That my kids get to expierence science"*
>
> *"Loved the amount of activities."*

All respondents (100%) indicated that they think it is important for these kinds of activities to be available to the public. They added specific comments to explain why it is important, which most often referenced the need for education and exposure to science through hands-on learning:

> *"Fun activity, it increase my daughters interest in different areas of science"*
>
> *"I believe science is important for everyone to learn"*
>
> *"Children learn better doing hands on activities"*

Respondents were also provided the opportunity to identify additional topics of interest, which elicited a number of topics, including: dinosaurs, reptiles, mammals, cavemen, rocks, insects, fish, stars/planets, evolution, climate change, big cats, Australian and Chinese animals, Egypt, Nebraska native invertebrates, seashell creatures, and special needs.

Youth Survey

A total of 42 youth also completed an exit survey after participating in the Eight-Legged Encounters Event. The gender of respondents was split (50% female, 50% male), and ages ranged from 4 to 14 with a mean of 7.7. The youth survey asked questions to gauge how much the younger participants enjoyed each of the stations. Figure 6 shows that the popularity ranking of these stations corresponds well to reports from adult participants, with "Path of Predators Activity Booklet," "Community Experiment" and "Microscope Madness" reported as the top three for both adults and youth. The "Path of Predators Activity Booklet" was the most popular among youth, with 22% indicating they liked the station a little, and 59% indicating they liked the station a lot (Figure 4). Many stations, such as "Build a Burrow" and "Sticky vs. Wooly Silk" had several youth indicating that they did not visit the station; however, this may indicate that the younger respondents did not know or forgot the names of several stations since adult data showed that these stations, with the exception of "Build a Burrow" were visited by most.

Figure 6: How much youth liked each station.

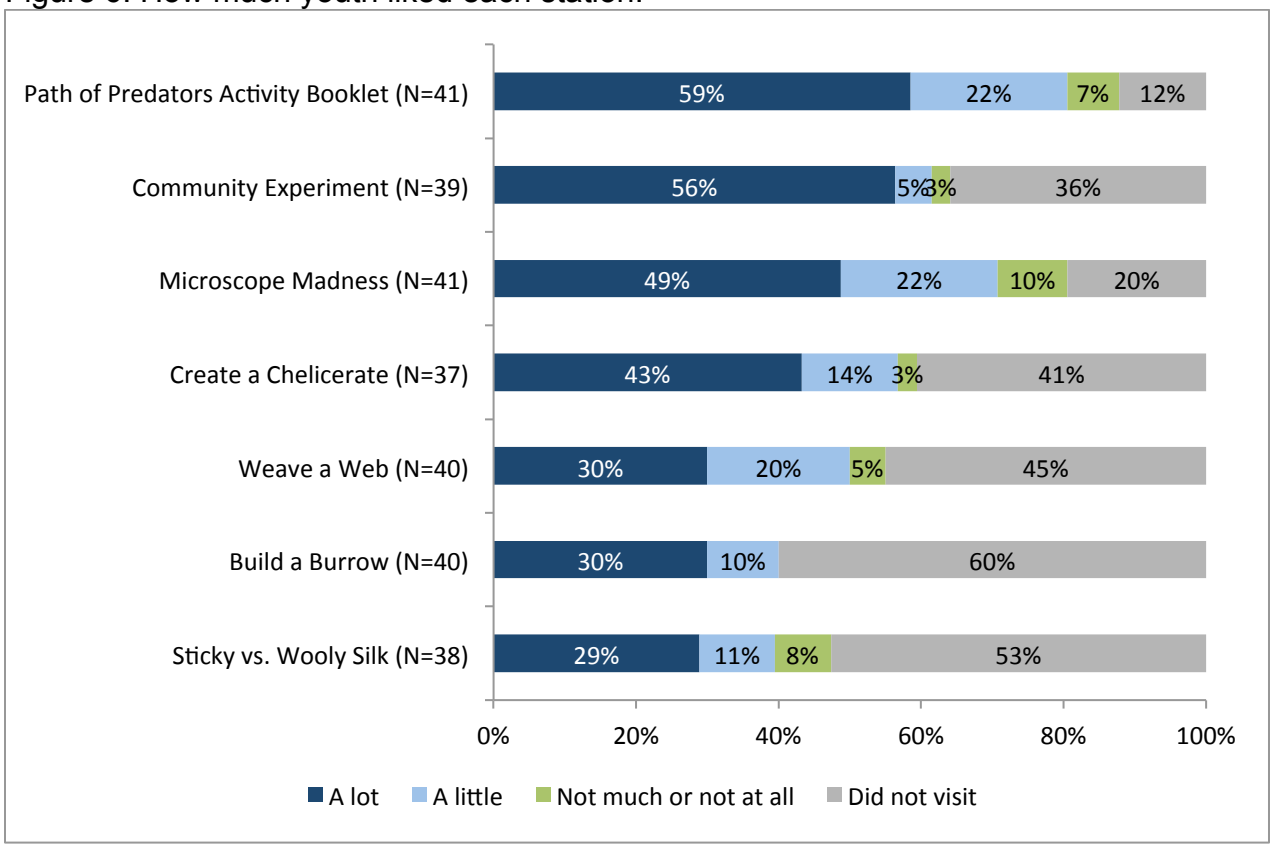
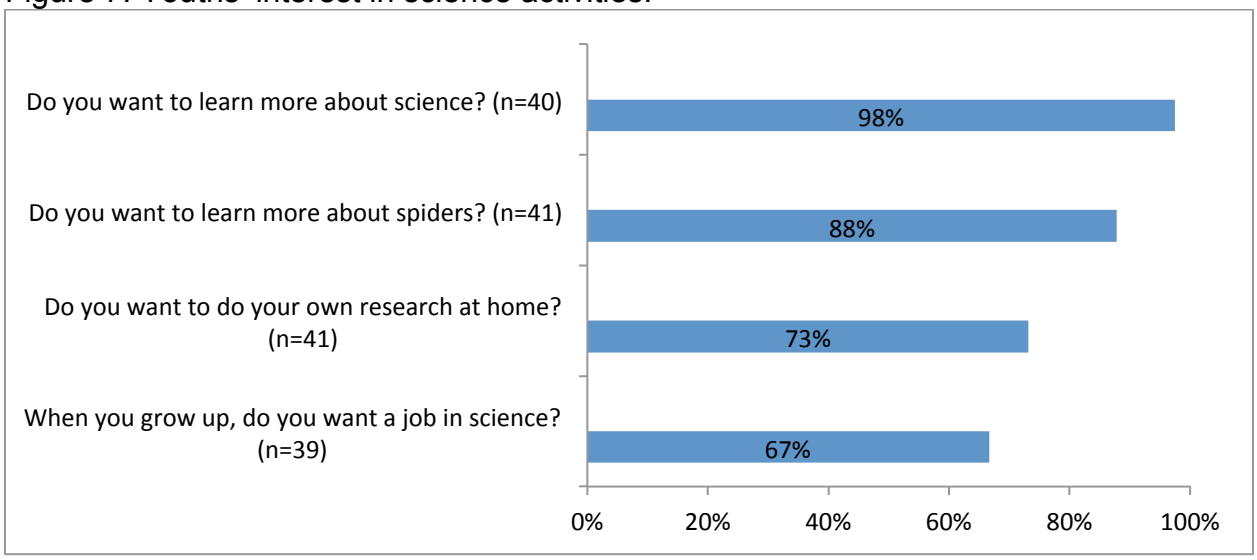


Figure 7 shows that youth are eager to learn more and have an interest in pursuing science. Nearly all (98%) youth indicated that they want to learn more about science, and 88% want to specifically learn more about spiders. Nearly three quarters (73%) reported wanting to do their own research at home. Finally, 67% expressed a desire to purse a job in science when they grow up.

Figure 7: Youths' interest in science activities.

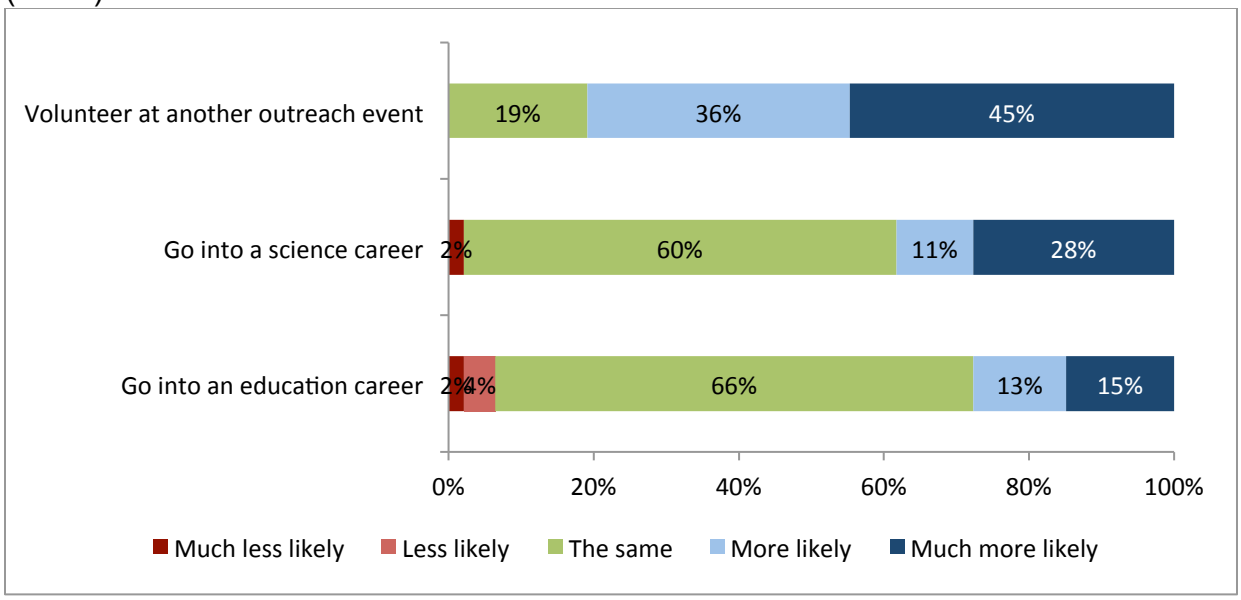


Volunteer survey

In addition to simply help staff the event, using volunteers at the Eight-Legged Encounters even was an opportunity to provide science students with experience implementing science outreach. Volunteers were asked to complete a survey after working at the event to assess the impact on their lives. Among the 47 volunteer respondents, the gender breakdown closely mirrored that of adult participants, with 57% of volunteers being female. Over half (55%) of volunteers were under the age of 25, which reflects the utilization of students as volunteers.

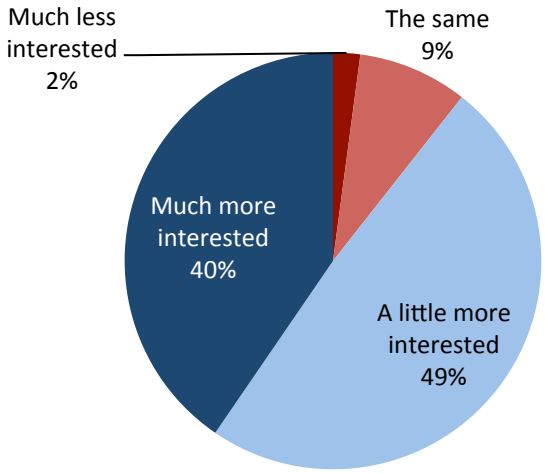
The experience of serving as a volunteer increased the likelihood of volunteering at another outreach event in the future. As Figure 8 shows, over 80% of volunteers indicated that they were either more likely (36%) or much more likely (45%) to volunteer at another outreach event. While less change was observed with impacting future careers, 39% reported a higher likelihood of pursuing a science career (11% more likely and 28% much more likely), and 28% indicated a higher likelihood of pursuing a career in education (13% more likely and 15% much more likely).

Figure 8: Change in likelihood of volunteers participating in activities in the future (N=47).



Most volunteers rated their volunteer experience highly, with a mean score of 4.5 on a scale of 1 (the worst) to 5 (the best). Nearly all (96%) felt they were provided sufficient information to volunteer at their station. Responses were split when asked if they felt conveying science to the general public was harder or easier than expected, with 39% reporting it to be easier and 13% found it to be harder (the remaining 48% felt it matched their expectations). Regardless, the large majority of volunteers had an increase in interest in conveying science to the general public after participating in this event, with nearly half (49%) expressing a little more interest and 40% reporting much more interest (Figure 9).

Figure 9: Change in interest of volunteers in conveying science to the general public (N=47).



Overall, the volunteers reported it being a great experience and interacting with the youth was most often specified as their favorite part of the experience:

> *"Some children are awesome & demystifying things w/ adults"*
>
> *"Watching the kids get excited about learning."*
>
> *"Seeing young kids get really interested in science & something new."*

While the volunteers were enlisted to teach participants about spiders and science, 73% of the volunteers report that they also learned something at the event, both spider-specific knowledge, and science communication knowledge more generally:

> *"Bolas spiders are skilled hunters. Young kids love a good challenge."*
>
> *"The kids are willing to listen to scientific facts more than I previously thought."*
>
> *"How to teach science to younger audiences."*

There were also many parts of the event that surprised the volunteers. Most commonly reported was surprise with the number of attendees and how busy it was.

> *"…I am pleasantly surprised by parents that ask questions too, sad when they think they're gross."*
>
> *"The number of volunteers was impressive & the number of attendees was more than expected."*

"How enthused all the guests were & how openly we could discuss science!"

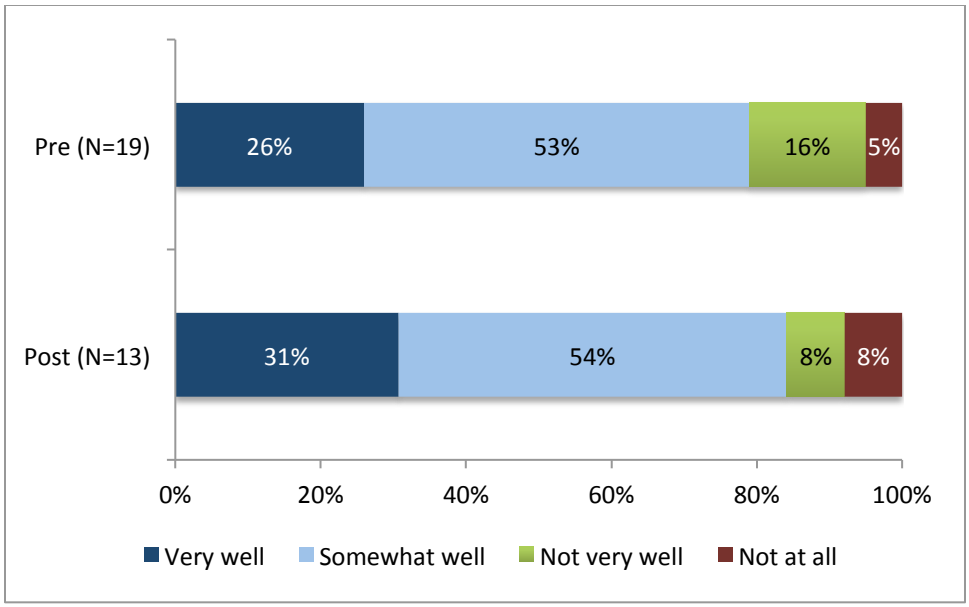
Very few suggestions were offered for future improvements because most volunteers felt the event went very well. The suggestions that were offered include: a chair, faster drying glue, one specimen per scope, food, better station location, make sure education/science is pushed, more organizaton/order, more time between groups, more relevanat background information, more stations, more headlamps, more volunteers, pre-made tools, and prepare things ahead of time.

After School Science Clubs

Seminar students administered a pre- and post-test survey to participants in their after-school clubs. Some core questions were asked for both clubs, while other items were club-specific. This section addresses the questions asked of both clubs. It should be noted that while pre- and post-surveys were administered, the clubs did not have a steady group of attendees every week so the number of respondents between each survey fluctuates as does the actual make-up of the students who completed each survey. Therefore, due to the small response size and transient nature of the make-up of students in the clubs, these items should be interpreted with caution. In total, 19 participants completed the pre-test and 14 completed the post-test. At pre-test, 56% of respondents were male, while at post-test, the gender distribution was evenly split (50% male, 50% female).

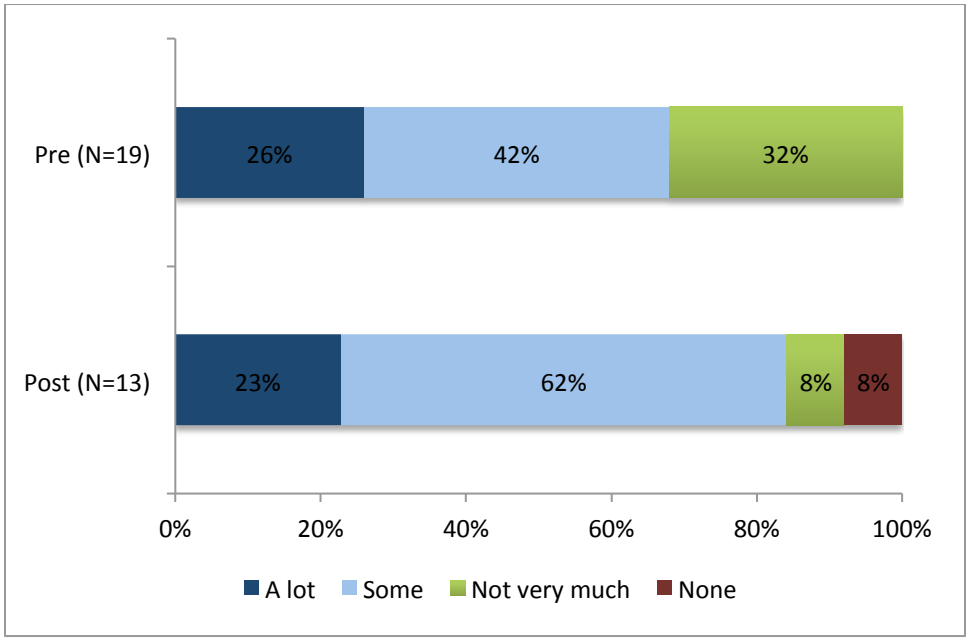
Two of the core questions asked of both clubs inquired about students' understanding of science and their understanding of what scientists do. Some slight change was observed from pre- to post-test among student reports of their understanding of science, with the proportion of student reporting that they understand science well or very well increasing from 79% to 85% (Figure 10).

Figure 10: Students' understanding of science before and after participating in clubs.



Similarly, the proportion of students reporting that they understand what scientists do increased over time (Figure 11). While the majority (68%) reported that they understood a lot or some prior to participating in the club, this proportion increased to 85% after completing the club.

Figure 11: Students' understanding of what scientists do before and after participating in clubs.



Figures 12 and 13 show the impact on students' interest in science and having a future job in science. On both items, fewer students reported being either very or somewhat interested in both science and having a future job in science after participating in the clubs.

Figure 12: Students' interest in science before and after participating in clubs.

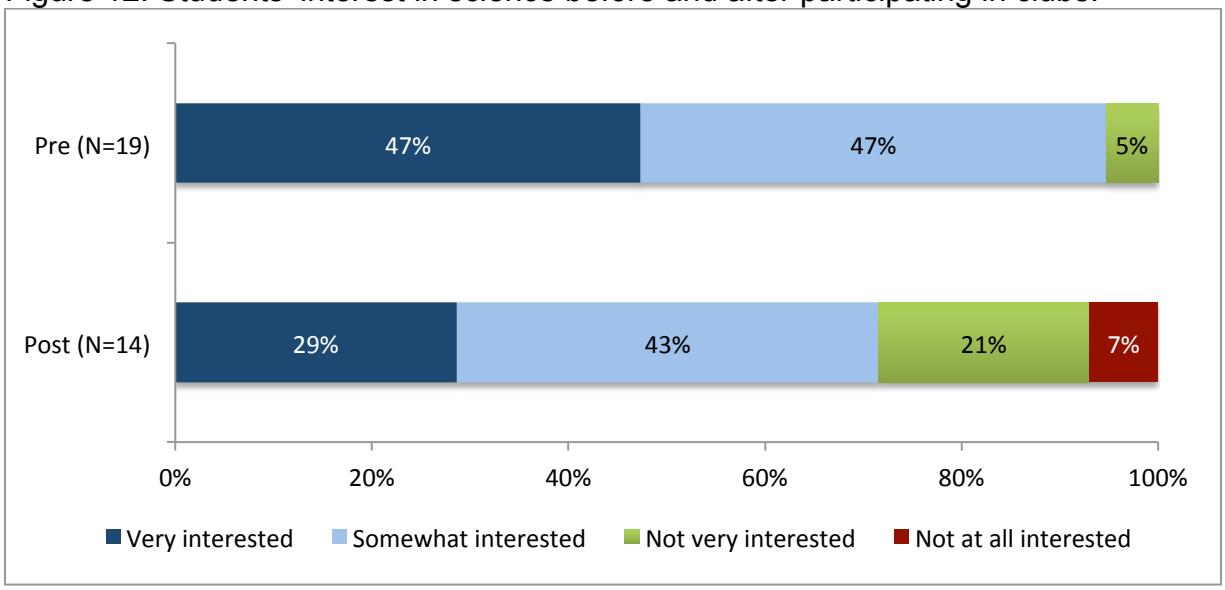
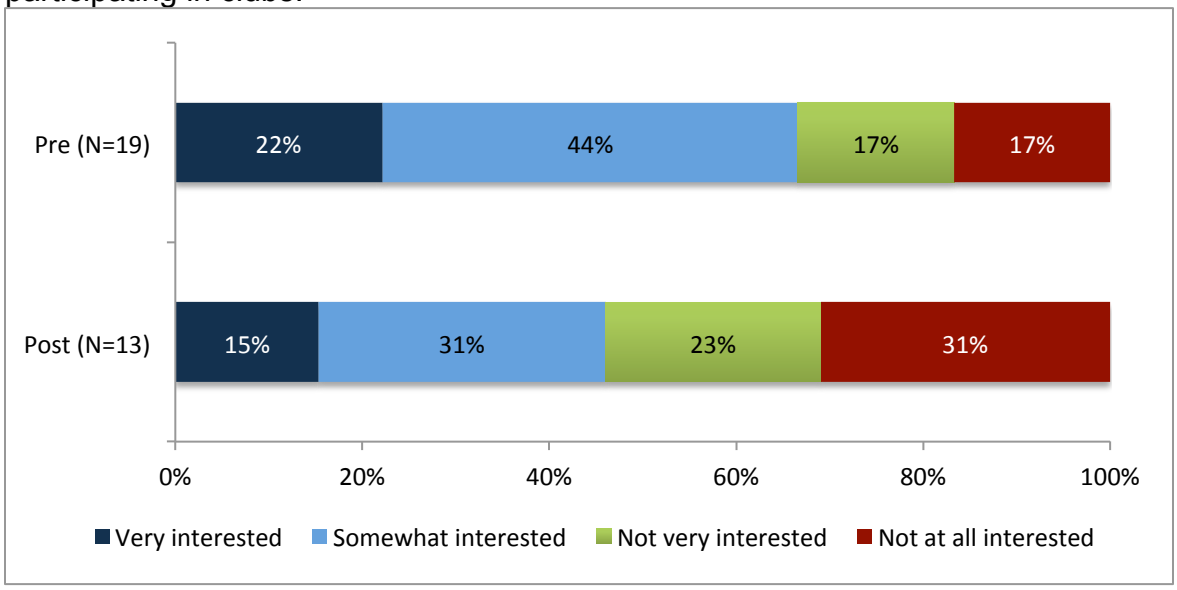


Figure 13: Students' interest in having a future job in science before and after participating in clubs.



After completing the club, students reported having fun learning about science in the club. The majority (62%) reported having a lot of fun, 23% reported having some fun, while 15% reported not having fun at all. Students also indicated that they learned about science in the club, with over half (58%) reporting that they learned a lot, one-third (33%) learned some, and only 8% felt that they did not learn much. Results were mixed when asked if they would participate in another science after-school club, with 23% reporting that they definitely would, 39% probably would, 8% probably would not, and 31% definitely would not.

Before the club, students were asked why they were participating in the club. Most of the students joined for fun and the subject matter of the clubs:

> *"Because I love animals- I'm very interested"*
>
> *"Because I think science is interesting"*
>
> *"To learn and have fun"*

After the club, students reported what they liked most about participating in the club, which most often was learning in a fun environment with direct interaction with animals and insects.

> *"Learning in a fun way"*
>
> *"Holding bugs"*

Finally, students described something new that they learned in their club, which most often was a new fact that they learned about insects or animals.

> *"I learned that there is a bird that can imitate other sounds such as chainsaws and car alarms"*
>
> *"That a beetle pretends to be dead when threatened"*
>
> *"Turtles has a lot of eggs"*

Science Communication Seminar

Focus Group

Similar to the first year, seminar students completed a focus group to provide feedback about the course. When asked what they liked best about the course, one theme that recurred was the flexibility within the course: "*there was a lack of structure within a structure."* Students reported enjoying the freedom they were given within the course and with their teams: *"Like having the freedom to teach the kids about whatever we were interested in…that way we would be passionate about what we were teaching too."* The students also indicated that they both enjoyed the way they worked together often, but that as groups, they were able to give and receive feedback from the other group: "*I really liked how we were allowed to get feedback from the other groups…we were allowed to practice in here and get feedback."*

A common suggestion for course improvement was having more class time for club planning: *"We could have spent the first three or four weeks of class planning the*

clubs…instead of meeting with people." There were also suggestions about the content of the lectures given: "*If we just had more practical lecture components, more hands on things. People demonstrating effective means of going about this, not necessarily strict guidelines, but giving more of a ground work on what we're going to be dealing with."*

The seminar students provided examples to describe how their knowledge of science communication had been impacted, including as explanation of how difficult it is to implement: *"it's a lot harder to bring some things that I think are in higher education almost taken for granted and expected to lay persons and to make it relatable.*" The students also discussed how teaching the after-school clubs affected their own understanding of the science material that they presented. Some of the students felt like they stayed within their own comfort level in preparing lessons so they did not branch out too much in their own knowledge: *"On my part at least, I knew a lot of the stuff and I always like to share the same stuff because I know what activities worked."* On the other hand, some students felt like they were forced to expand their own knowledge in teaching the clubs: *"Most of the activities forced me to broaden my knowledge on some things that I normally wouldn't necessarily be interested in or was apprehensive about learning."* Another added: "*Having another group helped me to broaden my knowledge. Looking at the activities that the other group did, helped me to step back and open my mind to other types of activities that would also work."*

When asked how participating in the course and the after-school clubs had influenced their future career goals, some said that while they respected middle school teachers, they personally were not interested in pursuing the career: "*I had thoughts about it before class. I just can't imagine middle school if I go into teaching. I think I'd do high school or community college instead."* In contrast, another student mentioned a new consideration in outreach as a career option after the class: *"I underestimated middle schoolers. I want to keep up this outreach in the future and keep in mind middle school teaching as an option for a career.*"

Finally, students reflected on what they thing it is important for scientists to know, based on their experience with the after-school clubs. Students had many insightful suggestions about keeping the material relevant and simple:

> *"That what they think is primitive is not primitive. You have to take what you think is simple and basic and break it down into something more simple and basic."*
>
> *"Seems really important to have at least one sentence that relates what you're teaching to their life."*
>
> *"Scientists need to remember that they aren't talking to scientists…you really have to stop and think for a moment about what you're really trying to say and break it down to its core component and it's tough, really tough."*

End-of-Course Evaluations

The end-of-course evaluations from year two showed that students were overwhelming positive in their assessment of the class as a whole. Unlike the previous year where there was a divide between students on whether or not they felt the class met its goals, in year two, all five students reported that the course purpose was fully met by the instructor. Similarly, all five students indicated that the overall teaching effectiveness of the instructor was excellent. Students felt overall that the presentations and explanations was almost always (80%) or often (20%) presented in a way that was helpful for their understanding of the subject matter.

One area where there was less agreement among the students was whether or not the text and/or assigned readings were effective learning aids. While 40% of students felt they were almost always effective, 40% felt that they were hardly ever effective. One of the students expanded on this: *"I got the book before I found out it wasn't needed, so that would have been nice to know beforehand. And the few readings/discussions...I didn't get anything from them & honestly don't remember them. There's more potential here.*"

There were many positive comments in regards to the course as a whole and about the incorporation of the clubs within the class, most often referencing the flexibility and interaction with middle school students:

> *"Freedom to do what you're interested in! And practical help plus club run throughs."*
>
> *"Learned a TON about interacting w/ middle schoolers- what works/ what doesn't for communicating science."*
>
> *"Very flexible w/ schedule, not much stress on grades allows us to focus on learning course material and doing better in our clubs."*

Conclusions

The evaluation data suggests that the Eight-Legged Educators program continues to succeed. Exit surveys show that the Eight-Legged Encounters event increased both the public's knowledge of science and its interest in the subject. Participants of the events appreciated the interactive nature of the event and felt that the event was engaging and well organized.

The after-school science clubs produced mixed results in terms of change over time after participating in the program, with slight increases in understanding of science and what scientists do and decreases in interests in science and pursuing a career in science. However, the sample size was small and consistency from pre- to post-test was a challenge, so these findings should be interpreted with caution. Overall, the participants had fun and learned about science by participating in the club.

The seminar course was well received by the students, with significant appreciation for the flexibility built into the course. All students felt that the course met its goals and the course purpose was met. Reported course challenges were the perceived ineffectiveness of assigned readings and a desire for more class time for club planning. The experience impacted some students' future career plans by helping them realize that teaching middle school students may or may not be a good fit for them. Students also gained an appreciation for what it takes to effectively communicate science to middle school students by keeping it relevant and simple.

Appendices

Eight-Legged Encounters Year Two

Adult Survey

Eight-Legged Encounters Experience Questionnaire

We would like to learn more about your experiences at this event today. Please take some time to let us know your thoughts.

1. How interesting did you find the following stations/materials?	Very Interesting	Somewhat Interesting	A Little Interesting	Not Interesting	Did Not Visit
1. Create a chelicerate	○	○	○	○	○
2. Build a burrow	○	○	○	○	○
3. Sticky vs. wooly silk	○	○	○	○	○
4. Weave a web	○	○	○	○	○
5. Microscope madness	○	○	○	○	○
6. Path of predators activity booklet	○	○	○	○	○
7. Community Experiment	○	○	○	○	○

2. After participating in this event….	Much less likely	Less Likely	The same	More likely	Much more likely
a. how much more or less likely are you to set up your own experiment at home?	○	○	○	○	○
b. how much more or less likely are you to kill a spider in your house?	○	○	○	○	○
c. how much more or less likely are you to attend another similar event?	○	○	○	○	○
d. how much more of less likely are you to take the time to observe a spider, or other arachnid?	○	○	○	○	○
e. how much more or less likely are you to say that you understand what the scientific process is?	○	○	○	○	○
f. how much more or less likely are you to read about arachnids?	○	○	○	○	○

3. After participating in this event, did this make you more or less likely to consider a future job in science?
   - ○ Much less likely
   - ○ A little less likely
   - ○ The same
   - ○ A little more likely
   - ○ Much more likely
   - ○ Not applicable

4. After participating in this event, how much more or less interested are you in learning about scientific discoveries?
   - ○ Much less interested
   - ○ A little less interested
   - ○ The same
   - ○ A little more interested
   - ○ Much more interested

5. What surprised you about this event?

6. Did you learn anything new?
   - ○ No
   - ○ Yes → 6a. If so, please describe:

7. What was most meaningful to you from today's exhibit?

8. How effective was the artwork in engaging you with the exhibit?
   - ○ Not at all effective
   - ○ A little effective
   - ○ Somewhat effective
   - ○ Very effective

9. How effective were the volunteers in engaging you with the exhibit?
   - ○ Not at all effective
   - ○ A little effective
   - ○ Somewhat effective
   - ○ Very effective

10. How could the volunteers be more effective in engaging you with the exhibit?

11. What did you like best about this event?

12. Do you think it is important for these kids of activities to be available to the public?
    - ○ No
    - ○ Yes → 12a. If so, why?

13. What is your gender?
    - ○ Male
    - ○ Female

14. What is your current age?
    - ○ Less than 25
    - ○ 25-34
    - ○ 35-44
    - ○ 45-54
    - ○ 55-64
    - ○ 65 or older

15. How did you learn about this event?
    - ○ Newspaper
    - ○ Radio
    - ○ School
    - ○ Museum Website
    - ○ Friends of the Museum
    - ○ Facebook
    - ○ UNL email
    - ○ TV
    - ○ Attended other Sunday with a Scientist
    - ○ Other:
    - ○ Did not know it was going on

16. What is the zipcode for where you live?

17. Please list suggestions for additional topics that may be of interest to you:

18. Please use the space below to provide any additional comments or feedback:

Youth Survey

How much did you like the...	A lot	A little	Not much or not at all	Did Not Visit
1. Create a chelicerate	○	○	○	○
2. Build a burrow	○	○	○	○
3. Sticky vs. wooly silk	○	○	○	○
4. Weave a web	○	○	○	○
5. Microscope madness	○	○	○	○
6. Path of predators activity booklet	○	○	○	○
7. Community Experiment	○	○	○	○

Do you want to learn more about spiders?

○ Yes
○ No

Do you want to learn more about science?

○ Yes
○ No

Do you want to do your own research at home?

○ Yes
○ No

When you grow up, do you want a job in science?

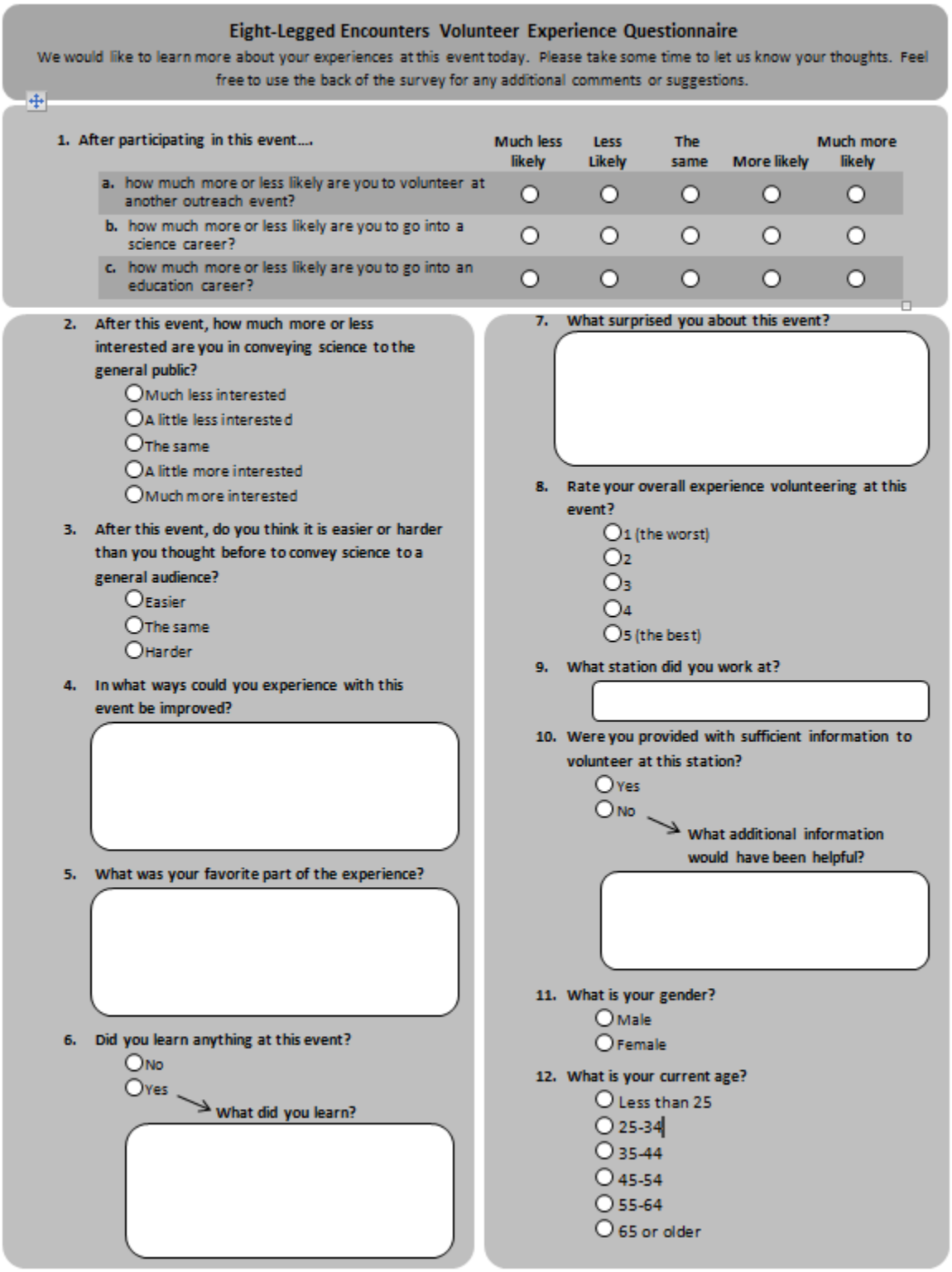
○ Yes
○ No

How old are you?

(INTERVIEWER MAKE NOTE OF THIS) What is your gender?

○ Male
○ Female

Volunteer Survey



Eight-Legged Encounters Volunteer Experience Questionnaire

We would like to learn more about your experiences at this event today. Please take some time to let us know your thoughts. Feel free to use the back of the survey for any additional comments or suggestions.

1. After participating in this event….

	Much less likely	Less Likely	The same	More likely	Much more likely
a. how much more or less likely are you to volunteer at another outreach event?	○	○	○	○	○
b. how much more or less likely are you to go into a science career?	○	○	○	○	○
c. how much more or less likely are you to go into an education career?	○	○	○	○	○

2. After this event, how much more or less interested are you in conveying science to the general public?
   - ○ Much less interested
   - ○ A little less interested
   - ○ The same
   - ○ A little more interested
   - ○ Much more interested

3. After this event, do you think it is easier or harder than you thought before to convey science to a general audience?
   - ○ Easier
   - ○ The same
   - ○ Harder

4. In what ways could you experience with this event be improved?

5. What was your favorite part of the experience?

6. Did you learn anything at this event?
   - ○ No
   - ○ Yes → What did you learn?

7. What surprised you about this event?

8. Rate your overall experience volunteering at this event?
   - ○ 1 (the worst)
   - ○ 2
   - ○ 3
   - ○ 4
   - ○ 5 (the best)

9. What station did you work at?

10. Were you provided with sufficient information to volunteer at this station?
    - ○ Yes
    - ○ No → What additional information would have been helpful?

11. What is your gender?
    - ○ Male
    - ○ Female

12. What is your current age?
    - ○ Less than 25
    - ○ 25-34
    - ○ 35-44
    - ○ 45-54
    - ○ 55-64
    - ○ 65 or older

Appendix B: After School Science Club Surveys

Group 1 Pre-club survey

After School Science Club Pre-Survey

Please answer the following questions about your thoughts on science. There are no right or wrong answers. We just want to hear what you think. Thank you!

1. **How interested are you in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested

2. **How well do you understand science?**
   - ○ Very well
   - ○ Somewhat well
   - ○ Not very well
   - ○ Not at all

3. **How much do you know about what scientists do?**
   - ○ A lot
   - ○ Some
   - ○ Not very much
   - ○ None

4. **How interested are you in having a future job in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested

5. **Are you a boy or a girl?**
   - ○ Boy
   - ○ Girl

6. **The definition for "life" is:**
   - ○ Easy to define
   - ○
   - ○
   - ○
   - ○ Difficult to define

7. **The number of unique life forms on earth ranges from:**
   - ○ 1- 100
   - ○ 101-1000
   - ○ 1001-10,000
   - ○ Greater than 10,000

8. **What are your feelings toward science?**

Exciting	○	○	○	○	○	○	Boring
Unfair	○	○	○	○	○	○	Fair
Impossible	○	○	○	○	○	○	Possible
Opportunity	○	○	○	○	○	○	Waste of time

9. **Why are you participating in this club?**

Group 2 Pre-club Survey

After School Science Club Pre-Survey

Please answer the following questions about your thoughts on science. There are no right or wrong answers. We just want to hear what you think. Thank you!

1. **How interested are you in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested

2. **How well do you understand science?**
   - ○ Very well
   - ○ Somewhat well
   - ○ Not very well
   - ○ Not at all

3. **How much do you know about what scientists do?**
   - ○ A lot
   - ○ Some
   - ○ Not very much
   - ○ None

4. **How interested are you in having a future job in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested

5. **Are you a boy or a girl?**
   - ○ Boy
   - ○ Girl

6. **How often do you spend time in nature?**
   - ○ Once a day
   - ○ Once a week
   - ○ Once a month
   - ○ Once a month
   - ○ Less than once a year

7. **How much time do you spend with your family in nature?**
   - ○ Once a day
   - ○ Once a week
   - ○ Once a month
   - ○ Once a year
   - ○ Less than once a year

8. **Do you currently do any activities that help improve the environment? Select all that apply.**
   - ○ Pick up trash
   - ○ Recycle
   - ○ Carpool to school
   - ○ Plant trees
   - ○ Use reusable items (bottles, bags, etc.)
   - ○ Other:

9. On a scale of 1 to 10, how important is wildlife to you?

- ○ 1 (least important)
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10 (most important)

10. On a scale of 1 to 10, how interested are you in learning about wildlife?

- ○ 1 (least interested)
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10 (most interested)

11. Describe two key differences between mammals and birds:

12. Why are you participating in this club?

Group 1 Post-club Survey

After School Science Club Experience Survey

Please answer the following questions about your experience in this club. There are no right or wrong answers. We just want to hear what you think about the club. Thank you!

1. **How interested are you in science?**
   - ◯ Very interested
   - ◯ Somewhat interested
   - ◯ Not very interested
   - ◯ Not at all interested

2. **How well do you understand science?**
   - ◯ Very well
   - ◯ Somewhat well
   - ◯ Not very well
   - ◯ Not at all

3. **How much do you know about what scientists do?**
   - ◯ A lot
   - ◯ Some
   - ◯ Not very much
   - ◯ None

4. **How interested are you in having a future job in science?**
   - ◯ Very interested
   - ◯ Somewhat interested
   - ◯ Not very interested
   - ◯ Not at all interested

5. **How much fun did you have learning about science in this club?**
   - ◯ I did not have fun at all
   - ◯ I did not have much fun
   - ◯ I had some fun
   - ◯ I had a lot of fun

6. **How much did you learn about science in this club?**
   - ◯ I learned a lot
   - ◯ I learned some
   - ◯ I did not learn much
   - ◯ I did not learn at all

7. **If another science after-school club were offered, would you participate in that program?**
   - ◯ I definitely would not
   - ◯ I probably would not
   - ◯ I probably would
   - ◯ I definitely would

8. **Are you a boy or a girl?**
   - ◯ Boy
   - ◯ Girl

9. **The definition for "life" is:**
   - ◯ Easy to define
   - ◯
   - ◯
   - ◯
   - ◯ Difficult to define

10. **The number of unique life forms on earth ranges from:**
    - ◯ 1-100
    - ◯ 101-1000
    - ◯ 1001-10,000
    - ◯ Greater than 10,000

11. What are your feelings toward science?

Exciting	○	○	○	○	○	○	Boring
Unfair	○	○	○	○	○	○	Fair
Impossible	○	○	○	○	○	○	Possible
Opportunity	○	○	○	○	○	○	Waste of time

12. What did you like most about participating in this club?

13. Describe something new that you learned in this club. You may use words or draw a picture to describe what you learned.

Group 2 Post-club Survey

After School Science Club Experience Survey

Please answer the following questions about your experience in this club. There are no right or wrong answers. We just want to hear what you think about the club. Thank you!

1. **How interested are you in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested
2. **How well do you understand science?**
   - ○ Very well
   - ○ Somewhat well
   - ○ Not very well
   - ○ Not at all
3. **How much do you know about what scientists do?**
   - ○ A lot
   - ○ Some
   - ○ Not very much
   - ○ None
4. **How interested are you in having a future job in science?**
   - ○ Very interested
   - ○ Somewhat interested
   - ○ Not very interested
   - ○ Not at all interested
5. **How much fun did you have learning about science in this club?**
   - ○ I did not have fun at all
   - ○ I did not have much fun
   - ○ I had some fun
   - ○ I had a lot of fun
6. **How much did you learn about science in this club?**
   - ○ I learned a lot
   - ○ I learned some
   - ○ I did not learn much
   - ○ I did not learn at all
7. **If another science after-school club were offered, would you participate in that program?**
   - ○ I definitely would not
   - ○ I probably would not
   - ○ I probably would
   - ○ I definitely would
8. **Are you a boy or a girl?**
   - ○ Boy
   - ○ Girl
9. **How often do you spend time in nature?**
   - ○ Once a day
   - ○ Once a week
   - ○ Once a month
   - ○ Once a month
   - ○ Less than once a year
10. **How much time do you spend with your family in nature?**
    - ○ Once a day
    - ○ Once a week
    - ○ Once a month
    - ○ Once a year
    - ○ Less than once a year
11. **Do you currently do any activities that help improve the environment? Select all that apply.**
    - ○ Pick up trash
    - ○ Recycle
    - ○ Carpool to school
    - ○ Plant trees
    - ○ Use reusable items (bottles, bags, etc.)
    - ○ Other:

12. On a scale of 1 to 10, how important is wildlife to you?

- ○ 1 (least important)
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10 (most important)

13. On a scale of 1 to 10, how interested are you in learning about wildlife?

- ○ 1 (least interested)
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10 (most interested)

14. Describe two key differences between mammals and birds:

15. What did you like most about participating in this club?

16. Describe something new that you learned in this club. You may use words or draw a picture to describe what you learned.

Appendix C: Seminar focus group script

Student Focus Group Questions

1. What do you like best about the course?
2. What do you like least and what could be improved?
3. How do you feel this class has increased your knowledge of science communication?
4. Has teaching this after-school clubs affected your understanding of the curriculum material?
    a. If yes, how so?
5. How has this course (and the after-school clubs) influenced your future goals in science?
6. How has this course (and the after-school clubs) influenced your future career goals?
7. From your experience with the after-school clubs, what would say is important for scientists to know about science outreach?
8. Now that you've spent a semester with your after school clubs, what skills do you wish you had before you had started with the clubs?
9. Do you have any ideas of other outlets for science outreach that could be used in the class in the future?
10. After your experience with the after-school clubs, how will you do science differently now?

    Should time allow:

11. What worked well with your after-school clubs this semester?
12. What challenges have you confronted with your after-school clubs?
13. How have you been able to address those challenges?
14. Would you change anything with your after-school clubs this year? If so, what would you change?

Appendix D: Eight-Legged Encounters Frequency Table

Adult Exit Survey

How interesting did you find the following stations/materials: Create a Chelicerate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	35	53.0	56.5	56.5
	Somewhat interesting	9	13.6	14.5	71.0
	A little interesting	1	1.5	1.6	72.6
	Did not visit	17	25.8	27.4	100.0
	Total	62	93.9	100.0	
Missing	System	4	6.1		
Total		66	100.0		

How interesting did you find the following stations/materials: Build a Burrow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	30	45.5	49.2	49.2
	Somewhat interesting	4	6.1	6.6	55.7
	A little interesting	2	3.0	3.3	59.0
	Did not visit	25	37.9	41.0	100.0
	Total	61	92.4	100.0	
Missing	System	5	7.6		
Total		66	100.0		

How interesting did you find the following stations/materials: Sticky vs. Wooly Silk

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	32	48.5	52.5	52.5
	Somewhat interesting	11	16.7	18.0	70.5
	A little interesting	2	3.0	3.3	73.8
	Did not visit	16	24.2	26.2	100.0
	Total	61	92.4	100.0	
Missing	System	5	7.6		
Total		66	100.0		

How interesting did you find the following stations/materials: Weave a Web

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	29	43.9	47.5	47.5
	Somewhat interesting	8	12.1	13.1	60.7
	A little interesting	7	10.6	11.5	72.1
	Did not visit	17	25.8	27.9	100.0
	Total	61	92.4	100.0	
Missing	System	5	7.6		
Total		66	100.0		

How interesting did you find the following stations/materials: Microscope Madness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	42	63.6	68.9	68.9
	Somewhat interesting	10	15.2	16.4	85.2
	A little interesting	2	3.0	3.3	88.5
	Did not visit	7	10.6	11.5	100.0
	Total	61	92.4	100.0	
Missing	System	5	7.6		
Total		66	100.0		

How interesting did you find the following stations/materials: Path of Predators activity booklet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	36	54.5	60.0	60.0
	Somewhat interesting	12	18.2	20.0	80.0
	Not interesting	2	3.0	3.3	83.3
	Did not visit	10	15.2	16.7	100.0
	Total	60	90.9	100.0	
Missing	System	6	9.1		
Total		66	100.0		

How interesting did you find the following stations/materials: Community Experiment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interesting	40	60.6	64.5	64.5
	Somewhat interesting	8	12.1	12.9	77.4
	A little interesting	1	1.5	1.6	79.0
	Did not visit	13	19.7	21.0	100.0
	Total	62	93.9	100.0	
Missing	System	4	6.1		
Total		66	100.0		

After participating in this event, how much more or less likely are you to set up your own experiment at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	9	13.6	13.8	13.8
	Less likely	2	3.0	3.1	16.9
	The same	21	31.8	32.3	49.2
	More likely	28	42.4	43.1	92.3
	Much more likely	5	7.6	7.7	100.0
	Total	65	98.5	100.0	
Missing	System	1	1.5		
Total		66	100.0		

After participating in this event, how much more or less likely are you to kill a spider in your house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	13	19.7	20.3	20.3
	Less likely	24	36.4	37.5	57.8
	The same	22	33.3	34.4	92.2
	More likely	2	3.0	3.1	95.3
	Much more likely	3	4.5	4.7	100.0
	Total	64	97.0	100.0	
Missing	System	2	3.0		
Total		66	100.0		

After participating in this event, how much more or less likely are you to attend another similar event

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	5	7.6	7.8	7.8
	Less likely	1	1.5	1.6	9.4
	The same	7	10.6	10.9	20.3
	More likely	27	40.9	42.2	62.5
	Much more likely	24	36.4	37.5	100.0
	Total	64	97.0	100.0	
Missing	System	2	3.0		
Total		66	100.0		

After participating in this event, how much more or less likely are you to take the time to observe a spider, or other arachnid

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	6	9.1	9.4	9.4
	Less likely	1	1.5	1.6	10.9
	The same	10	15.2	15.6	26.6
	More likely	28	42.4	43.8	70.3
	Much more likely	19	28.8	29.7	100.0
	Total	64	97.0	100.0	
Missing	System	2	3.0		
Total		66	100.0		

After participating in this event, how much more or less likely are you to say that you understand what the scientific process is

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	3	4.5	4.7	4.7
	Less likely	1	1.5	1.6	6.3
	The same	22	33.3	34.4	40.6
	More likely	28	42.4	43.8	84.4
	Much more likely	10	15.2	15.6	100.0
	Total	64	97.0	100.0	
Missing	System	2	3.0		
Total		66	100.0		

After participating in this event, how much more or less likely are you to read about arachnids

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	5	7.6	7.8	7.8
	The same	21	31.8	32.8	40.6
	More likely	30	45.5	46.9	87.5
	Much more likely	8	12.1	12.5	100.0

	Total	64	97.0	100.0	
Missing	System	2	3.0		
Total		66	100.0		

After participating in this event, did this make you more or less likely to consider a future job in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	1	1.5	1.6	1.6
	The same	30	45.5	47.6	49.2
	A little more likely	8	12.1	12.7	61.9
	Much more likely	6	9.1	9.5	71.4
	Not applicable	18	27.3	28.6	100.0
	Total	63	95.5	100.0	
Missing	System	3	4.5		
Total		66	100.0		

After participating in this event, how much more or less interested are you in learning about scientific discoveries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less interested	1	1.5	1.6	1.6
	A little less interested	1	1.5	1.6	3.2
	The same	19	28.8	30.2	33.3
	A little more interested	24	36.4	38.1	71.4
	Much more interested	18	27.3	28.6	100.0
	Total	63	95.5	100.0	
Missing	System	3	4.5		
Total		66	100.0		

What surprised you about this event
OF PARTICIPANTS AND VOLUNTEERS
2 TYPES OF SILK NUMBER OF SUBGROUPS
ACTUAL INTERACTION WITH SPIDERS AND GOOD FOR ALL AGES
ALL THE HANDS ON & LIVE SPECIMENS
ALL THE HANDS ON EXPERIENCES FOR THE CHILDREN :)
ALL THE HANDS ON THINGS WAS VERY GOOD
ALL THE LIVE SPIDERS + HOW KID FRIENDLY IT WAS
APPRECIATE THE STAFF'S EXCITEMENT WORKING WITH THE CHILDREN
CATCHING YOUR OWN SPIDER
CHILDREN EVEN MORE ENGAGED THAN USUAL.
COMMUNITY INVOLVEMENT SEEMED VERY HIGH WELL DONE WITH MOTIVATED EDUCATED VOLUNTEERS
EVERYTHING
GETTING TO FEED SPIDERS
GREAT INFORMATION FOR KIDS
GREAT WORKERS AT ALL STATION, GOOD STATIONS
HOW MANY STATIONS
HOW MUCH STUFF THERE IS & HOW MANY PEOPLE WERE HERE
HOW MY 15 YR OLD REALLY WAS INTERESTED IN ALL OF IT!
HOW WELL IT WAS PUT TOGETHER
HUGE COLLECTION OF FOSSILS, ESP MAMMOTHS
I ACTUALLY DIDN'T KNOW IT WAS GOING ON. I LOVED THAT BOTH MY CHILD AND MYSELF LEARNED NEW THINGS
I HAD NO IDEA SO MUCH OF THIS MUSEUM WAS FOUND I
IT WAS VERY INFORMATIVE
IT WAS VERY INTERSTING HELPED EDUCATE OUR CHILDREN BETTER.
LEARNING HOW TO IDENTIFY THE DIFFERENT SPIDERS
LIGHT REFLECTING EYES ON SPIDERS
LIVE BUGS
LOTS OF INTERESTING STUFF ABOUT SPIDERS
N/A
NUMBERS OF SPECIES
SO FRIENDLY
SO MANY EXHIBITS
SPIDERS/INSECTS ARE NOT AS POISONOUS AS I THOUGHT MAKING THEM LESS INTIMIDATING
THAT I COULD TOUCH SPIDERS & OTHER INSECTS

THAT IT WAS HERE
THAT MOST SPIDERS ARE BLIND
THAT THERE ARE TRANTULAS IN NEBR.
THE AMOUNT OF ACTIVITIES LOVED IT!
THE AMOUNT OF EXIBITS
THE COMMUNITY EXPERIMENT WAS GREAT
THE FLOW WAS BETTER THAN SIMILAR EVENTS WE HAVE ATTENDED
THE NUMBER OF ACTIVITIES
THE ORGANIZATION
THE ORGANIZERS DID A FANTASTIC JOB! THIS WAS BY FAR THE BEST SUNDAY WITH A SCIENTIST WE HAVE EVER ATTENDED. MY KIDS WANT TO COME BACK TO MORRILL HALL NEXT WEEKEND
THERE WERE A LOT OF PEOPLE WHO ATTENDED
VERY COMPLETE
WELL ORGANIZED HANDS ON ACTIVITIES

Did you learn anything new

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	4.5	6.0	6.0
	Yes	47	71.2	94.0	100.0
	Total	50	75.8	100.0	
Missing	System	16	24.2		
Total		66	100.0		

[if yes] If so, please describe
2 TYPES OF SILK
A GREAT DEAL MOE ABOUT ALL THINGS SPIDERS
ABOUT HOW CERTAIN INSECTS EAT
ARTIFICIAL WEBS- WOW
ASK MY KIDS
BLIND ARACHNIDS
BURROW STATION VERY INTERESTING
CAN MAKE SPIDER WEB
DADDY LONG LEGS ARE NOT AGRESSIVE
DADDY LONG LEGS ARE NOT VENOMOUS
DADDY LONG LEGS HAVE NO POISON
DIFF TYPES OF WEB TYPES OF SPIDERS.
DIFFERENT GROUPS OF ARACHNIDS
EX. HARVESTER SPIDERS ARE NOT REALLY SPIDERS AND ARE NOT VENOMOUS
HOW SMALL SOME SCORPIONS ARE
HOW TO IDENTIFY SEVERAL SPIDERS
HOW WE PRODUCE SPIDER SILK (USING GOAT MILK THAT'S GENETICALLY MODIFIED).
I HAVE A GREATLY ENHANCED APPRECIATION OF AR
LEARNED MORE ABOUT NE SPIDERS AND TICKS.
LEARNED MORE ABOUT SPIDERS TODAY THEN I KNEW BEFORE
LOTS OF UNIQUE BEHAVIOR OF THE ANIMALS! STUDENTS VERY INFORMATIVE.
MANY
MORE ABOUT DIFFERENT SPIDERS LIKE REFLECTIVE EYES AND SUCH
N/A
NEW SPECIES
PSEUDOSCORPIONS
SCORPIONS CAN GLOW
SOME CENTIPEDES WERE POISUNOUS-VENOMOUES
SON ENJOYED LOOKING FOR SPIDER EYES IN THE DARK
SPIDER BURROWS
SPIDER SILK FACTS
SPIDERS EAT CRICKETS FIRST B/C THEY CAN SEE THEM MOVE.
THAT MOST SPIDERS DON'T SEE WELL.

THAT NEBR. HAS THE LARGEST ELEPHANT FOSSIL COLLECTIONS
THE THELYPHONIDA IS AN ORGANISM I HAD NOT PREVIOUSLY HEARD ABOUT
THERE ARE SCORPIONS IN NEBRASKA
THIS WAS AMAZING BEST SUNDAY YET!
TOO MANY THINGS- BUT FOR EX. DADDY LONG LEGS ARE NOT SPIDERS

What was most meaningful to you from today's exhibit
CHANCE OF DOING EXPERIENCE
DOING THE HANDS ON EVENTS
EDUCATION ABOUT ALL LIFE IS SO IMPORTANT!
FAMILY TIME
FAMILY TIME IN A PRODUCTIVE EDUCATIONAL MANNER
GETTING KIDS EXCITED ABOUT ARACHNIDS
GETTING MY CHILDREN EXCITED ABOUT THINGS THEY WOULD NOT NORMALLY CARE ABOUT
GREAT INFO
HANDS ON EVENTS
HOLDING DIFFERENT ARACHNIDS
KATYDID
LOVED SEEING A REAL PINKY TOED TARANTULA!
LOVED THE HUGE SNAKE
MAMOTHS & TITAN BOA
MY DAUGHTER ACTUALLY TOUCHED A TARANTULA + TO SEE INTERACTING WITH THE INSECTS
MY DAUGHTER ENJOYED IT!
MY KIDS ENJOYED IT.
MY KIDS HAVING FUN
N/A
PATHUAL FOR KIDS
SEE ANSWER #6.
SHOW IN PLANETARIUM
SILK USES
SPIDERS IN THE DARK W/GLOWING EYES + BLACK LITE SCORPIONS
TEACHING THE PUBLIC MORE ABOUT SPIDERS
THE EXPERIMENT
THE KIDS ARE INTERESTED IN THE SCIENTIFIC PROCESS
THE LIVE SPIDERS
THE NATIVE AMERICAN DISPLAY
TIME WITH FAMILY
TITANABOA
TOUCHING SPIDER
VIBRATION AND WEB STATION AND MY DAUGHTERS REACTION
WATCHING MY CHILDREN INTERACT.
WATCHING MY KIDS LIGHT UP...

WEB BUILDING

How effective was the artwork in engaging you with the exhibit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A little effective	9	13.6	16.7	16.7
	Somewhat effective	14	21.2	25.9	42.6
	Very effective	31	47.0	57.4	100.0
	Total	54	81.8	100.0	
Missing	System	12	18.2		
Total		66	100.0		

How effective were the volunteers in engaging you with the exhibit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all effective	1	1.5	1.8	1.8
	A little effective	2	3.0	3.6	5.4
	Somewhat effective	5	7.6	8.9	14.3
	Very effective	48	72.7	85.7	100.0
	Total	56	84.8	100.0	
Missing	System	10	15.2		
Total		66	100.0		

How could the volunteers be more effective in engaging you with the exhibit
-
A FEW WEREN'T VERY INTO IT AND COULD HAVE BEEN MORE
CANNOT VERY INFORMATIVE
CREATE A CHELICERATE WAS NOT ENGAGING
DID A GREAT JOB W/ENGAGEMENT
ENGAGING CHILDREN IS ALWAY DIFFICULT...
EVERYONE WAS GREAT
EVERYONE WAS HELPFUL & ENGAGING
EVERYONE WAS VERY FRIENDLY + FUN TO WORK WITH
EVERYONE WAS VERY HELPFUL
I THINK THEY ALL DID A GREAT JOB!
I THOUGHT THEY ALL DID A GREAT JOB!
IF FULL, KIND OF EXPLAIN IF OR WHEN WE CAN COME BACK. DON'T IGNORE
LOVED THEM!
MORE HANDOUTS
MORE TIME
N/A
N/AP
NA
NONE. THEY DID GREAT!
NOT MUCH
NOTHING GOOD JOB!
THE VOLUNTEERS DID AN EXCELLENT JOB
THEY DID A GREAT JOB HELPING EVERYONE.
THEY DID FINE.
THEY DID GREAT!
THEY DID VERY GOOD AS IT HAPPENS - KUDOS TO ALL. THANK YOU
THEY WERE GREAT
THEY WERE GREAT!
THEY WERE PERFECT
THEY WERE SO ENTHUSIASTIC. THEY WERE PERFECT.
THOUGHT THEY WERE EXCELLENT!
TRAINING TO TALK TO KIDS
VERY GOOD

What did you like best about this event
A LOT OF THINGS TO LOOK AT AND LEARN
ACTIVITY PACKS TO FOLLOW ALONG
ALL THE EXHIBITS
ALL THE HANDS ON
COLORFUL INTERESTING
EDUCATIONAL
ENGAGING PUBLIC IN TOPICS THEY WOULDN'T NORMALLY KNOW
ENTHUSIASM OF VOLUNTEERS
EVERYTHING
EXPERIMENT
EXPERIMENT + SPIDER
GREAT ACTIVITIES
HANDS ON
HANDS ON ACTIVITIES AND ONE ON ONE INTERACTION
HENRY DOORLY ZOO
HOW EXTENSIVE
INTERACTIONS W/ MY KIDS
INTERACTIVE THINGS FOR THE KIDS
LIVE EXIBITS
LIVE SPECIMENS
LOVED THE AMOUNT OF ACTIVITIES
MAMOTH & OTHER TOSSILS TITAN BOA EXHIBIT
MICROSCOPES
REFLECTIVE EYES - WHO KNEW?
SPIDERS & PROPS
SPIDERS LIVE BY
TAKING PHOTO W/ MAMMOTH
THAT MY KIDS GET TO EXPIERENCE SIENCE
THE EXPERIMENT
THE INTERACTION WITH DIFFERENT SPECIES OF SPIDERS, ECT.
THE LIVE SPECIMENS THE INFORMATIVE POSTERS & THE VOLUNTEERS' ENTHUSIASM
THE ORGANIZATION
THE SPIDER EXPERIMENT
THE TIME & PATIENCE OF THESE NICE UNL STUDENTS

THE VARIETY & THE LIVE EXHIBITS. THE APPLESAUCE GUY WAS GREAT TOO!
THELYPHONIDA EXHIBIT
WATCHING MY SONS' LISTENING + LEARNING

Do you think it is important for these kinds of activities to be available to the public

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	50	75.8	100.0	100.0
Missing	System	16	24.2		
Total		66	100.0		

[If yes] If so, why
ABSOLUTELY- CHILDREN NEED TO VALUE AND PROTECT THE NATURAL WORLD
CHILDREN LEARN BETTER DOING HANDS ON ACTIVITIES
CREATE AWARENESS FOR SCIENCE
CREATE INTEREST IN SCIENCE
EDUCATION OF NATURE
EDUCATIONAL
EDUCATIONAL + FUN
EXPAND THEIR EXPERIENCES
EXPLORATION/LEARNING
EXPOSURE TO SCIENCE
FOR THEM TO SEE FIRST HAND NOT ON A SCREEN
FUN ACTIVITY IT INCREASE MY DAUGHTERS INTEREST IN DIFFERENT AREAS OF SCIENCE
GETS THEM MORE INTERESTED
GREAT HANDS ON LEARNING
GREAT LEARNING EXPERIENCE
GREAT WAY TO LEARN AND EXPLORE
HELPS THEM LEARN
I BELIEVE SCIENCE IS IMPORTANT FOR EVERYONE TO LEARN
KIDS LEARN BY INTERACTING & DISCOVERY
LEARN MORE ABOUT CREATION, HAVE MORE CURIOSITY & RESPECT FOR ALL CREATURES
LEARNING ABOUT NATURE AND SCIENCE
MORE ACCURATE EDUCATIONAL INFO
MORE EXPOSURE HANDS ON LEARNING
OPPORTUNITIES TO LEARN
SO MEANINGFUL FOR KIDS! LOTS OF LEARNING!
SPARK THEIR INTEREST
TAKES FEAR AWAY
TEACHING OLD + YOUNG!
VERY EDUCATIONAL
WE HAVE TO GET KIDS EXCITED @ AN EARLY AGE
WON'T GET EXPOSURE IF NOT
YOU DON'T SEE THIS ON THE IPAD...

Please use the space below to provide any additional comments or feedback
-
A WONDERFUL WAY TO SPEND TIME WITH FAMILY AND FRIENDS. ALL AGES CAN LEARN. THANKS!
BROUGHT 5 YR OLD AND 9 YR OLD
GREAT DAY!
GREAT JOB! BIOLOGY IS AN AMAZING SCIENCE!
GREAT JOB!!
GREAT: SPIDER-IFFIC! :)
GREAT! ACTIVITY
HAD A GREAT TIME
LOVE IT! KEEP IT UP.
N/A
N/AP
NA
SURVEYS ROCK :)
THANK YOU!
TOOK MY 2 GRANDKIDS + THEY HAD A GREAT TIME

Youth Exit Survey

How much did you like the Create a Chelicerate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	16	38.1	43.2	43.2
	A little	5	11.9	13.5	56.8
	Not much or not at all	1	2.4	2.7	59.5
	Did not visit	15	35.7	40.5	100.0
	Total	37	88.1	100.0	
Missing	System	5	11.9		
Total		42	100.0		

How much did you like the Build a Burrow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	12	28.6	30.0	30.0
	A little	4	9.5	10.0	40.0
	Did not visit	24	57.1	60.0	100.0
	Total	40	95.2	100.0	
Missing	System	2	4.8		
Total		42	100.0		

How much did you like the Sticky vs. Wooly Silk

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	11	26.2	28.9	28.9
	A little	4	9.5	10.5	39.5
	Not much or not at all	3	7.1	7.9	47.4
	Did not visit	20	47.6	52.6	100.0
	Total	38	90.5	100.0	
Missing	System	4	9.5		
Total		42	100.0		

How much did you like the Weave a Web

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	12	28.6	30.0	30.0
	A little	8	19.0	20.0	50.0
	Not much or not at all	2	4.8	5.0	55.0
	Did not visit	18	42.9	45.0	100.0
	Total	40	95.2	100.0	
Missing	System	2	4.8		
Total		42	100.0		

How much did youlike the Microscope Madness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	20	47.6	48.8	48.8
	A little	9	21.4	22.0	70.7
	Not much or not at all	4	9.5	9.8	80.5
	Did not visit	8	19.0	19.5	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

How much did you like the Path of Predators activity booklet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	24	57.1	58.5	58.5
	A little	9	21.4	22.0	80.5
	Not much or not at all	3	7.1	7.3	87.8
	Did not visit	5	11.9	12.2	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

How much did you like the Community Experiment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	22	52.4	56.4	56.4
	A little	2	4.8	5.1	61.5
	Not much or not at all	1	2.4	2.6	64.1
	Did not visit	14	33.3	35.9	100.0
	Total	39	92.9	100.0	
Missing	System	3	7.1		
Total		42	100.0		

Do you want to learn more about spiders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	85.7	87.8	87.8
	No	5	11.9	12.2	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

Do you want to learn more about science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	39	92.9	97.5	97.5
	No	1	2.4	2.5	100.0
	Total	40	95.2	100.0	
Missing	System	2	4.8		
Total		42	100.0		

Do you want to do your own research at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	71.4	73.2	73.2
	No	11	26.2	26.8	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

When you grow up, do you want a job in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	26	61.9	66.7	66.7
	No	13	31.0	33.3	100.0
	Total	39	92.9	100.0	
Missing	System	3	7.1		
Total		42	100.0		

How old are you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	5	11.9	12.2	12.2
	5	7	16.7	17.1	29.3
	6	4	9.5	9.8	39.0
	7	5	11.9	12.2	51.2
	8	5	11.9	12.2	63.4
	9	4	9.5	9.8	73.2
	10	5	11.9	12.2	85.4
	11	3	7.1	7.3	92.7
	14	3	7.1	7.3	100.0
	Total	41	97.6	100.0	
Missing	System	1	2.4		
Total		42	100.0		

What is your gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	20	47.6	50.0	50.0
	Female	20	47.6	50.0	100.0
	Total	40	95.2	100.0	
Missing	System	2	4.8		
Total		42	100.0		

Volunteer Survey

After participating in this event, how much more or less likely are you to volunteer at another outreach event

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The same	9	19.1	19.1	19.1
	More likely	17	36.2	36.2	55.3
	Much more likely	21	44.7	44.7	100.0
	Total	47	100.0	100.0	

After participating in this event, how much more or less likely are you to go into a science career

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	1	2.1	2.1	2.1
	The same	28	59.6	59.6	61.7
	More likely	5	10.6	10.6	72.3
	Much more likely	13	27.7	27.7	100.0
	Total	47	100.0	100.0	

After participating in this event, how much more or less likely are you to go into an education career

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Much less likely	1	2.1	2.1	2.1
	Less likely	2	4.3	4.3	6.4
	The same	31	66.0	66.0	72.3
	More likely	6	12.8	12.8	85.1
	Much more likely	7	14.9	14.9	100.0
	Total	47	100.0	100.0	

After this event, how much more or less interested are you in conveying science to the general public

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Much less interested	1	2.1	2.1	2.1
	The same	4	8.5	8.5	10.6
	A little more interested	23	48.9	48.9	59.6
	Much more interested	19	40.4	40.4	100.0
	Total	47	100.0	100.0	

After this event, do you think it is easier or harder than you thought before to convey science to a general audience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Easier	18	38.3	39.1	39.1
	The same	22	46.8	47.8	87.0
	Harder	6	12.8	13.0	100.0
	Total	46	97.9	100.0	
Missing	System	1	2.1		
Total		47	100.0		

In what ways could your experience with this event be improved
A CHAIR
EVENT WENT VERY WELL. FASTER DRYING GLUE WOULD HAVE BEEN HELPFUL AT OUR STATION
HAVE THE MICROSCOPES HAVE ONE SPECIMEN PER SCOPE SO THERE'S NOT A BUNCH OF THINGS LAYING AROUND
I LIKED THIS STATION! FOOD WOULD BE NICE, BUT REALLY NOT A NECESSITY
I THINK IT WAS RUN EXCELLENTLY! I THINK THAT EVERYONE LEARNED A LOT.
I THINK IT WAS WONDERFUL AS IT IS.
I THOUGHT IT WAS GREAT!
I THOUGHT IT WENT REALLY WELL
IT WAS GREAT
KIDS
MAKE OUR ROOM EASIER TO FIND (CATCH A MOTH)
MAKE SURE EDUCATION/SCIENCE IS PUSHED
MORE ORGANIZATION OF ORDER THE DISPLAYS ARE APPROACHED, MORE TIME BETWEEN GROUPS.
MORE ORGANIZED/ORDER THINGS

MORE RELEVANT BACKGROUND INFORMATION
MORE STATIONS-LESS WAIT TIME MORE HEADLAMPS & SPARE BATTERIES
N/A
NO IDEA
NO IMPROVEMENTS (MAYBE PROVIDE FOOD)
NONE IT WAS GREAT!
NONE, WENT WELL!
NOTHING FOR ME I LOVED HAVING THE ANIMALS AT MY STATION
NOTHING I HAD A GREAT EXPERIENCE
POSSIBLY ARE MORE VOLUNTEER? SOMETIMES DURING A RUSH IT WAS HARD TO TALK TO EVERYONE
PRE-MADE TOOLS
PREMADE TOOLS?
PREPARE SOME THINGS AHEAD OF TIME
THE KIDS SEEMED MORE FOCUSED ON GETTING ALL THEIR STAMPS THAN LEARNING AT OUR STATION
VOLUNTEER COULD BE BETTER INFORMED BEFOREHAND

What was your favorite part of the experience
AGE RANGE OF PARTICIPANTS
BEING ABLE TO INTERACT WITH THE INTERESTED KIDS-ALSO WALKING AROUND & LOOKING @ EVERYTHING
CONVEYING KNOWLEDGE TO GUESTS
GETTING TO TALK TO THE KIDS WHO WERE SCARED OF SPIDERS AT FIRST
GIVING TEMPORARY TATTOOS
HELPING THE KIDS BY ANSWERING THEIR QUESTIONS
HOW EXCITED SOME KIDS SEEM
HOW INTERACTIVE IT WAS FOR EVERYONE
I LOVED INTERACTING WITH THE ADULTS & CHILDREN- ALL SEEMED EQUALLY ENGAGED
INTERACTING W/ THE KIDS
INTERACTING WITH THE KIDS
JUST SEEING YOUNG KIDS GET REALLY INTERESTED IN SCIENCE & SOMETHING NEW
KID'S ENTHUSIASM.
KIDS
KIDS PICKING OUT THE CORRECT SIDE
LITTLE KIDS REACTIONS
MEETING & INTERACTING WITH MANY KIDS
SEEING HOW EXCITED THE KIDS WERE
SEEING KIDS FACES LOOKING THROUGH THE MICROSCOPES
SEEING KIDS LEARN & ENJOY SCIENCE
SEEING PARENTS LEARN AS MUCH AS THEIR KIDS
SEEING THE CHILDREN GET EXCITED
SEEING THE KID'S REACTIONS TO THE TARANTULAS
SOME CHILDREN ARE AWESOME & DEMISTIFYING THINGS W/ ADULTS
TALKING ABOUT AMBLYPIGILS
TALKING TO KIDS
TALKING WITH ALL THE KIDS!
TALKING WITH THE KIDS AND ENGAGING THEM.
TALKING/ TEACHING
TEACHING KIDS ABOUT SCIENCE & LEARNING MORE ABOUT THE TICK
TELLING THE KIDS HOW FUNNEL WEAVERS FEED
THE KIDS
THE KIDS THOUROUGHLY ENJOYED THE EXPERIENCE

THE KIDS' REACTIONS
WATCHING THE KIDS GET EXCITED ABOUT LEARNING.
WHEN KID'S PARENTS LEARN SOMETHING NEW!
WHEN KIDS ASKED IF THEY COULD DO THE ACTIVITY A SECOND TIME
WORKING HANDS ON WITH CHILDREN!
WORKING TOWARD FACING MY FEAR OF SPIDERS

Did you learn anything at this event

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	23.4	26.8	26.8
	Yes	30	63.8	73.2	100.0
	Total	41	87.2	100.0	
Missing	System	6	12.8		
Total		47	100.0		

[If yes] What did you learn
A LOT OF NEW INFORMATION ABOUT SPIDERS.
ABOUT SCHIZOMIDA
ALL ABOUT PALPIGRADI
ALL SCORPIONS GLOW UNDER BLACKLIGHT.
ANALOGIES AND METAPHORS ARE CRUCIAL
BLACK WIDOWS AND BROWN RECLUSES ARE THE ONLY DANGEROUS SPIDERS IN THE U.S.
BOLAS SPIDER
BOLAS SPIDERS ARE SKILLED HUNTERS. YOUNG KIDS LOVE A GOOD CHALLENGE
EVERYTHING ABOUT OPILIONES
HOW DIFFERENT SPIDERS MAKE DIFFERENT WEBS
HOW TO PRONOUNCE ARACHNID ORDERS!
HOW TO TEACH SCIENCE TO YOUNGER AUDIENCES
I HAVE VERY LITTLE EXPERIENCE WITH ARACHNIDS SO I WAS LEARNING A LOT
I KNEW VERY LITTLE ABOUT SPIDERS SO I LEARNED A LOT
I LEARNT ABOUT WHIPS OF THE ARACHNID.
KIDS
LIFECYCLE/INTERESTING FACTS ABOUT THE TICK
MORE ABOUT SPIDERS!
ORB WEAVERS USE SILK TO CATCH MOTHS AFTER ATTRACTING THEM WITH PHEREMONES
SOME PEOPLE ARE REALLY INTERESTED BUT NOT EVERYONE WANTS TO HEAR WHAT YOU HAVE TO SAY
SOME SPECIFIC FACTS ABOUT AN ARACHNID.
SPIDERS BUILD THEIR HOUSE UNDER THE GROUND
SPIDERS CHANGE COLOR & HAVE DIFFERENT WEBS
SPIDERS!
THAT SPIDERS CAN CHANGE COLOR
THAT THERE ARE A LOT OF DIFFERENT ARACHNIDS
THE GENERAL PUBLIC IS INTERESTED IN SUCH A FUN EVENT!
THE KIDS ARE WILLING TO LISTEN TO SCIENTIFIC FACTS MORE THAN I PREVIOUSLY THOUGHT.
THE RANGE OF DIVERSITY PRESENT
WOLF SPIDERS ARE COOL!! KIDS HAVE NO PROBLEM WITH PREDICTIVE EXPERIMENTS

What surprised you about this event
A LOT MORE PEOPLE THAN I THOUGHT THERE WOULD BE.
AMOUNT OF PEOPLE AND PARTICIPATION
AMOUNT OF PEOPLE ATTENDING
ATTENDANCE WAS REALLY HIGH
HOW BUSY IT WAS!
HOW DISINTERESTED SOME KIDS WERE COMPARED TO OTHERS
HOW ENTHUSED ALL THE GUESTS WERE & HOW OPENLY WE COULD DISCUSS SCIENCE!
HOW ENTHUSIASTIC ALL OF THE PARTICIPANTS WERE.
HOW FUN IT WAS TO INTERACT W/KIDS
HOW MANY DIFFERENT STATIONS THERE WERE
HOW MANY PEOPLE CAME
HOW MANY PEOPLE SHOWED UP
HOW MUCH KIDS ARE FASCINATED BY ANIMALS AND EVEN THE PARENTS GET INTO IT.
HOW POPULAR IT WAS
HOW SLOW IT WAS AT OUR STATION
KIDS
KIDS' KNOWLEDGE
LOTS OF ADULTS CAME THROUGH BY THEMSELVES
LOTS OF PEOPLE
N/A
N/A-SAME AS LAST YEAR I AM PLEASANTLY SURPRISED BY PARENTS THAT ASK QUESTIONS TOO, SAD WHEN THEY THINK THEY'RE GROSS
NOTHING
NUMBER OF VISITORS, ENTHUSIASM.
RESPONSE TO MY STATION: IT WAS BUSY ALL THE TIME.
SOME OF THE KIDS ASKED VERY GOOD QUESTIONS ABOUT SPIDERS AND/OR ALREADY NEW A LOT ABOUT SOME SPIDERS
SOME OF THE RESPONSES BY THE KIDS WERE MORE INSIGHTFUL THAN I THOUGHT.
THE HIGH # OF PEOPLE WHO CAME FOR SO LONG
THE KIDS WERE MOSTLY COMPLETELY COOL WITH SPIDERS
THE NUMBER OF KIDS ATTENDING
THE NUMBER OF VOLUNTEERS WAS IMPRESSIVE & THE NUMBER OF ATTENDEES WAS MORE THAN EXPECTED
THE SCOPE! THERE WERE MANY MORE PEOPLE THAN I EXPECTED

THE TURNOUT WAS WONDERFUL!
THERE WERE MANY PEOPLE, THE CONCEPTS WERE VERY EASY TO EXPLAIN & UNDERSTAND.
TURN OUT AND LEVEL OF PARTICIPATION
WASN'T AS CRAZY AS I THOUGHT STILL BUSY
WORKING WITH LIVE SPIDERS

Rate your overall experience volunteering at this event

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	4	8.5	8.9	8.9
	4	15	31.9	33.3	42.2
	5 (the best)	26	55.3	57.8	100.0
	Total	45	95.7	100.0	
Missing	System	2	4.3		
Total		47	100.0		

What station did you work at
ACARI
AMBLYPIGILS
AMBLYPOYGI
ARANEAE
ASSEMBLE ARACHNI AND WEAVE
ASSEMBLING AN ARACHNID
ASSEMBLING ARACHNIDS
AWESOME TELEPH.
BUILD A BURROW
BUILD BURROWS
BUILDING A BURROW
CATCH A MOTH
COMM EXP
COMMUNITY EXPERIMENT
CREATE A CHELICERATE
CRIBELLATE/ECRIBELLATE
CRILLIBATE VS ECRIBILLATE
MICROSCOPE MADNESS
MICROSCOPES
OPILIONES
PALPIGRADI
PAPER FLOWERS/YARN WEBS
PATH OF PREDATORS SOLFIFUGAE
PATH OF PREDATORS: ARANAE
PSEUDOSCORPION
RICINULEI
SCHIZOMIDA
SCORPIONES
THELGPHOMIDA
TISSUE PAPER FLOWERS
WEBS
WHAT'S AN ARTHROPOD?

Were you provided with sufficient information to volunteer at this station

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	93.6	95.7	95.7
	No	2	4.3	4.3	100.0
	Total	46	97.9	100.0	
Missing	System	1	2.1		
Total		47	100.0		

[If no] What additional information would have been helpful
A MORE SOLID INTRO TO MAKE PEOPLE INTERESTED I GUESS
I KNEW SOME ABOUT SPIDERS BUT NOT ENOUGH ABOUT SOME, SO I LET OTHERS TAKE THE LEAD ON THOSE- HOW THEY CATCH PREY, WHERE THEY LIVE, COMMON NAMESAS
I KNEW WHAT I NEEDED BEFOREHAND BUT NOT BECAUSE I WAS TOLD
INFORMATION ABOUT THE BACKGROUND OF SPIDERS
KIDS
MAYBE LABELS FOR ALL THE LIVE SPIDERS?
N/A
PRACTICAL TRAINING IN SPIDERS WOULD BE HELPFUL

What is your gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	20	42.6	42.6	42.6
	Female	27	57.4	57.4	100.0
	Total	47	100.0	100.0	

What is your current age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25	26	55.3	55.3	55.3
	25-34	19	40.4	40.4	95.7
	35-44	2	4.3	4.3	100.0
	Total	47	100.0	100.0	

Appendix E: After school science club Frequency Tables

Pre-test data

How interested are you in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very interested	9	47.4	47.4	47.4
	somewhat interested	9	47.4	47.4	94.7
	not very interested	1	5.3	5.3	100.0
	Total	19	100.0	100.0	

How well do you understand science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very well	5	26.3	26.3	26.3
	somewhat well	10	52.6	52.6	78.9
	not very well	3	15.8	15.8	94.7
	not at all	1	5.3	5.3	100.0
	Total	19	100.0	100.0	

How much do you know about what scientists do

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot	5	26.3	26.3	26.3
	some	8	42.1	42.1	68.4
	not very much	6	31.6	31.6	100.0
	Total	19	100.0	100.0	

How interested are you in having a future job in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very interested	4	21.1	22.2	22.2
	somewhat interested	8	42.1	44.4	66.7
	not very interested	3	15.8	16.7	83.3
	Not at all interested	3	15.8	16.7	100.0
	Total	18	94.7	100.0	
Missing	System	1	5.3		
Total		19	100.0		

Are you a boy or a girl

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	boy	10	52.6	55.6	55.6
	girl	8	42.1	44.4	100.0
	Total	18	94.7	100.0	
Missing	System	1	5.3		
Total		19	100.0		

Why are you participating in this club
Because I think science is interesting
because I can.
Because I have A's in science class and I want to learn more about science
because I have always loved animals
Because I like animals
Because I love animals; I' am very interested
Because I love snakes and spiders
Because its fun and exciting and I like education.
Everything! And I like this club
for the candy
Haveing fun
I am interested in animals; We do fun games; I like it much better than home-work or sports club
I dont know
I had no chooce
I like science and animals!!!!!!!!
It seems interestin
To learn and have fun.

Group 1 data

The definition for "life" is

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Easy to define	4	21.1	36.4	36.4
	2	1	5.3	9.1	45.5
	3	4	21.1	36.4	81.8
	Difficult to define	2	10.5	18.2	100.0
	Total	11	57.9	100.0	
Missing	System	8	42.1		
Total		19	100.0		

The number of unique life forms on earth ranges from

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	101-1000	2	10.5	18.2	18.2
	1001-10,000	2	10.5	18.2	36.4
	Greater than 10,000	7	36.8	63.6	100.0
	Total	11	57.9	100.0	
Missing	System	8	42.1		
Total		19	100.0		

What are your feelings toward science- Exciting v. Boring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1- Exciting	2	10.5	20.0	20.0
	2	3	15.8	30.0	50.0
	3	1	5.3	10.0	60.0
	4	4	21.1	40.0	100.0
	Total	10	52.6	100.0	
Missing	System	9	47.4		
Total		19	100.0		

What are your feelings toward science- Unfair v. Fair

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	5.3	11.1	11.1
	4	3	15.8	33.3	44.4
	5	3	15.8	33.3	77.8
	6- Fair	2	10.5	22.2	100.0
	Total	9	47.4	100.0	
Missing	System	10	52.6		
Total		19	100.0		

What are your feelings toward science- Impossible v. Possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	5.3	10.0	10.0
	4	4	21.1	40.0	50.0
	5	3	15.8	30.0	80.0
	6- Possible	2	10.5	20.0	100.0
	Total	10	52.6	100.0	
Missing	System	9	47.4		
Total		19	100.0		

What are your feelings toward science- Opportunity v. Waste of time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1- Opportunity	3	15.8	30.0	30.0
	2	1	5.3	10.0	40.0
	3	2	10.5	20.0	60.0
	4	4	21.1	40.0	100.0
	Total	10	52.6	100.0	
Missing	System	9	47.4		
Total		19	100.0		

Group 2 data

How often do you spend time in nature

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	once a day	5	26.3	62.5	62.5
	once a week	3	15.8	37.5	100.0
	Total	8	42.1	100.0	
Missing	System	11	57.9		
Total		19	100.0		

How much time do you spend with your family in nature

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	once a day	1	5.3	12.5	12.5
	once a week	4	21.1	50.0	62.5
	once a month	1	5.3	12.5	75.0
	less than once a year	2	10.5	25.0	100.0
	Total	8	42.1	100.0	
Missing	System	11	57.9		
Total		19	100.0		

Do you currently do any activities that help improve the environment- pick up trash

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	4	21.1	100.0	100.0
Missing	System	15	78.9		
Total		19	100.0		

Do you currently do any activities that help improve the environment- recycle

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	6	31.6	100.0	100.0
Missing	System	13	68.4		
Total		19	100.0		

Do you currently do any activities that help improve the environment- Carpool to school

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	2	10.5	100.0	100.0
Missing	System	17	89.5		
Total		19	100.0		

Do you currently do any activities that help improve the environment- plant trees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	3	15.8	100.0	100.0
Missing	System	16	84.2		
Total		19	100.0		

Do you currently do any activities that help improve the environment- use reusable items (bottles, bags, etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	3	15.8	100.0	100.0
Missing	System	16	84.2		
Total		19	100.0		

Do you currently do any activities that help improve the environment- Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	selected	1	5.3	100.0	100.0
Missing	System	18	94.7		
Total		19	100.0		

Do you currently do any activities that help improve the environment- other specify

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		18	94.7	94.7	94.7
	reuse water	1	5.3	5.3	100.0
	Total	19	100.0	100.0	

On a scale of 1 to 10, how important is wildlife to you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	1	5.3	12.5	12.5
	7	2	10.5	25.0	37.5
	9	1	5.3	12.5	50.0
	10 (most important)	4	21.1	50.0	100.0
	Total	8	42.1	100.0	
Missing	System	11	57.9		
Total		19	100.0		

On a scale of 1 to 10, how interested are you in learning about wildlife

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	1	5.3	12.5	12.5
	8	3	15.8	37.5	50.0
	10 (most interesting)	4	21.1	50.0	100.0
	Total	8	42.1	100.0	
Missing	System	11	57.9		
Total		19	100.0		

Describe two key differences between mammals and birds
feathers fly; fur walk
fur/feathers; bones
mammals are ground, birds are fly
mammals don't lay eggs except for the platypus. Birds lay eggs
mammals have four leg's and birds have two legs
mammals: they have fur/hair; they can't fly. Birds: they have feathers; they can fly
mammals= belly buttins; birds= fethers

Post-test data

How interested are you in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interested	4	28.6	28.6	28.6
	Somewhat interested	6	42.9	42.9	71.4
	Not very interested	3	21.4	21.4	92.9
	Not at all interested	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

How well do you understand science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very well	4	28.6	30.8	30.8
	Somewhat well	7	50.0	53.8	84.6
	Not very well	1	7.1	7.7	92.3
	Not at all	1	7.1	7.7	100.0
	Total	13	92.9	100.0	
Missing	System	1	7.1		
Total		14	100.0		

How much do you know about what scientists do

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	3	21.4	23.1	23.1
	Some	8	57.1	61.5	84.6
	Not very much	1	7.1	7.7	92.3
	None	1	7.1	7.7	100.0
	Total	13	92.9	100.0	
Missing	System	1	7.1		
Total		14	100.0		

How interested are you in having a future job in science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very interested	2	14.3	15.4	15.4
	Somewhat interested	4	28.6	30.8	46.2
	Not very interested	3	21.4	23.1	69.2
	Not at all interested	4	28.6	30.8	100.0
	Total	13	92.9	100.0	
Missing	System	1	7.1		
Total		14	100.0		

How much fun did you have learning about science in thisclub

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I did not have fun at all	2	14.3	15.4	15.4
	I had some fun	3	21.4	23.1	38.5
	I had a lot of fun	8	57.1	61.5	100.0
	Total	13	92.9	100.0	
Missing	System	1	7.1		
Total		14	100.0		

How much did you learn about science in this club

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I learned a lot	7	50.0	58.3	58.3
	I learned some	4	28.6	33.3	91.7
	I did not learn much	1	7.1	8.3	100.0
	Total	12	85.7	100.0	
Missing	System	2	14.3		
Total		14	100.0		

If another science after-school club were offered, would you participate in that program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I definitely would not	4	28.6	30.8	30.8
	I probably would not	1	7.1	7.7	38.5
	I probably would	5	35.7	38.5	76.9
	I definitely would	3	21.4	23.1	100.0
	Total	13	92.9	100.0	
Missing	System	1	7.1		
Total		14	100.0		

Are you a girl or a boy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Boy	6	42.9	50.0	50.0
	Girl	6	42.9	50.0	100.0
	Total	12	85.7	100.0	
Missing	System	2	14.3		
Total		14	100.0		

What did you like most about participating in this club
all of it
candy
holding bugs
I like the animals
insects
learning about animals
learning in a fun way
The betta fish and how you disterb them
touching the animals

Describe something new that you learned in this club. You may use words or draw a picture to describe what you learned
?
about insects
Analmls, fun
I learned that there is a bird that can immitate other sounds such as chainsaws and car alarms
some animals sounds what frogs from toads sound like
that a beetle pretends to be dead when threatened. Prey work together.
turtles has a lot of eggs
x

Group 1

The definition for "life" is

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1- Easy to define	4	28.6	50.0	50.0
	2	2	14.3	25.0	75.0
	3	1	7.1	12.5	87.5
	5- Difficult to define	1	7.1	12.5	100.0
	Total	8	57.1	100.0	
Missing	System	6	42.9		
Total		14	100.0		

The number of unique lifeforms on earth ranges from

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-100	1	7.1	16.7	16.7
	101-1000	1	7.1	16.7	33.3
	1001-10,000	2	14.3	33.3	66.7
	Greater than 10,000	2	14.3	33.3	100.0
	Total	6	42.9	100.0	
Missing	System	8	57.1		
Total		14	100.0		

What are your feelings towards science: Exciting v. Boring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1- Exciting	3	21.4	60.0	60.0
	2	1	7.1	20.0	80.0
	3	1	7.1	20.0	100.0
	Total	5	35.7	100.0	
Missing	System	9	64.3		
Total		14	100.0		

What are your feelings towards science: Unfair v. Fair

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	7.1	20.0	20.0
	4	1	7.1	20.0	40.0
	5	1	7.1	20.0	60.0
	6- Fair	2	14.3	40.0	100.0
	Total	5	35.7	100.0	
Missing	System	9	64.3		
Total		14	100.0		

What are your feelings towards science: Impossible v. Possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	7.1	16.7	16.7
	4	1	7.1	16.7	33.3
	5	2	14.3	33.3	66.7
	6- Possible	2	14.3	33.3	100.0
	Total	6	42.9	100.0	
Missing	System	8	57.1		
Total		14	100.0		

What are your feelings towards science: Opportunity v. Waste of time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1- Opportunity	2	14.3	40.0	40.0
	2	2	14.3	40.0	80.0
	3	1	7.1	20.0	100.0
	Total	5	35.7	100.0	
Missing	System	9	64.3		

Total		14	100.0		

Group 2

How often do you spend time in nature

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once a day	2	14.3	50.0	50.0
	Less than once a year	2	14.3	50.0	100.0
	Total	4	28.6	100.0	
Missing	System	10	71.4		
Total		14	100.0		

How much time do you spend with your family in nature

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once a week	1	7.1	33.3	33.3
	Once a month	1	7.1	33.3	66.7
	Less than once a year	1	7.1	33.3	100.0
	Total	3	21.4	100.0	
Missing	System	11	78.6		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Pick up trash

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selected	1	7.1	100.0	100.0
Missing	System	13	92.9		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Recycle

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selected	2	14.3	100.0	100.0
Missing	System	12	85.7		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Carpool to school

		Frequency	Percent
Missing	System	14	100.0

Do you currently do any activities that help improve the environment- Plant trees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selected	1	7.1	100.0	100.0
Missing	System	13	92.9		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Use reusable items (bottles, bags, etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selected	2	14.3	100.0	100.0
Missing	System	12	85.7		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selected	1	7.1	100.0	100.0
Missing	System	13	92.9		
Total		14	100.0		

Do you currently do any activities that help improve the environment- Other, specify

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		13	92.9	92.9	92.9
	none	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

On a scale of 1 to 10, how important is wildlife to you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	1	7.1	25.0	25.0
	9	1	7.1	25.0	50.0
	10- (most important)	2	14.3	50.0	100.0
	Total	4	28.6	100.0	
Missing	System	10	71.4		
Total		14	100.0		

On a scale of 1 to 10, how interested are you in learning about wildlife

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	8	1	7.1	25.0	25.0
	9	1	7.1	25.0	50.0
	10- (most important)	2	14.3	50.0	100.0
	Total	4	28.6	100.0	
Missing	System	10	71.4		
Total		14	100.0		

Describe two key differences between mammals and birds
mammals don't fly, birds fly
mammals don't lay eggs, except platpuses
mammals- fur, don't fly; birds- fly, feathers
mammals=belly bottuns; birds=wings

Appendix F: Seminar End-of-Course Evaluation Data

The instructor appeared to be interested in the subject and in teaching it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very much	5	100.0	100.0	100.0

The instructor presented course material in a well-organized manner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	4	80.0	80.0	80.0
	Often	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

The instructor's oral presentations and explanations were helpful in understanding the subject matter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	4	80.0	80.0	80.0
	Often	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

During lectures, opportunity was given for questions and comments by students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	5	100.0	100.0	100.0

The instructor stimulated your intellectual curiosity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very much	3	60.0	60.0	60.0
	Somewhat	2	40.0	40.0	100.0
	Total	5	100.0	100.0	

The instructor was willing to give individual aid

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Almost always	5	100.0	100.0	100.0

The instructor was able to sense when the students didn't understand

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	4	80.0	80.0	80.0
	Often	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

The instructor's knowledge of the subject appeared to be

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	5	100.0	100.0	100.0

The examination questions gave you a fair chance to demonstrate your knowledge of the subject matter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	1	20.0	20.0	20.0
	Not applicable	4	80.0	80.0	100.0
	Total	5	100.0	100.0	

Grading poilicies were

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	5	100.0	100.0	100.0

The student was accurately informed of his/her standing throughout the course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always	3	60.0	60.0	60.0
	Sometimes	2	40.0	40.0	100.0
	Total	5	100.0	100.0	

The text and/or assigned reading have been effective learning aids to you

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Almost always	2	40.0	40.0	40.0
	Seldom	1	20.0	20.0	60.0
	Hardly ever	2	40.0	40.0	100.0
	Total	5	100.0	100.0	

The purpose of this course (as stated by the instructor) was accomplished

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully	5	100.0	100.0	100.0

All things considered, how would you rate the overall teaching effectiveness of this instructor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	5	100.0	100.0	100.0

Which one of the following best describes your attendance in this class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never absent	1	20.0	20.0	20.0
	Rarely absent	4	80.0	80.0	100.0
	Total	5	100.0	100.0	

Which one of the following best describes the work you have been doing for this course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am doing okay without much effort	2	40.0	40.0	40.0

I am getting a lot out of the course but I have to work hard	3	60.0	60.0	100.0
Total	5	100.0	100.0	

Are there any outstandingly good features of this course
Freedom to do what you're interested in! And practical help plus club run throughs. No pressure for a grade which is great.
I love being more focused on the experience & what we get from the course rather than focusing on a grade. Class time to plan & run through clubs was super beneficial.
The interactions w/ middle schoolers. The trainings w/ Kathy French, Abby (sp?), Bess, and Group 2 & Eileen.
Very flexible w/ schedule, not much stress on grades allows us to focus on learning course material and doing better in our clubs.

Are there any outstandingly bad features of this course
No
Not really. A few things seems a lot out of order, like making evals then talking about them more.
We didn't ned the book really, otherwise no.
We didn't use the books we bought, wish I would have more time w/ the kids

General comments
Fun class
Great course for experience. I got the book before I found out it wasn't needed, so that would have been nice to know beforehand. And the few readings/discussions...I didn't get anything from them & honestly don't remember them. There's more potential here.
Learned a TON about interacting w/ middle schoolers- what works/ what doesn't for communicating science.