

Spark!Lab Visitor Survey Study

National Museum of American History

Lemelson Center for the Study of Invention and Innovation



Office of Policy and Analysis
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Smithsonian Institution

Contents

I.	Preface	2
II.	Background	3
III.	Methodology	5
IV.	Key Findings: Survey Questions	6
V.	Key Findings: Visitor Comments	9
VI.	Discussion	12
VII.	Recommendations	13
	Appendix A: 2006 Data	15
	Appendix B: 2010 Data	17
	Appendix C: Cross-Tabulations	19
	Appendix D: One-Page Summary	21

I. Preface and Acknowledgments

The Office of Policy and Analysis (OP&A) was pleased to undertake a survey of visitors to the National Museum of American History's Spark!Lab space in July and August of 2010.

The Spark!Lab survey offered a unique opportunity to investigate visitors' experiences in Spark!Lab longitudinally, in comparison to a 2006 study of what was then the Hands On Science Center in the same space. Leading this study was Andrew Pekarik, who worked alongside Zahava Doering from OP&A. Renae Youngs, an OP&A graduate intern from the University of Washington, managed the survey and completed preliminary analysis and reporting. The study was commissioned by Tricia Edwards of the Lemelson Center. Facilitating the survey by serving as data collectors and offering other support as needed were Lemelson Center staff members Tricia Edwards, Aaron Alcorn, Tanya Garner, Mark Kovey, Catherine Kruchten, Steven Madewell, Juliana Nganele, and Christopher White, and Spark!Lab docents Marty Bienstock and Mark Kovey. I would like to thank them for their hard work and enthusiasm.

Carole Neves, Ph.D.

Director

Office of Policy and Analysis

II. Background

Spark!Lab is a permanent area in the National Museum of American History and is part of the museum's Lemelson Center for the Study of Invention and Innovation. It is a hands-on space intended for children ages 5-12 (plus an adjacent area for younger children) to engage in invention-related activities.

The Space.

Spark!Lab is different from most museum spaces in that it is interactive and designated especially for children. The purpose of the space is to “use fun activities to help kids and families learn about the history and processes of invention.”¹ The space includes a curved “lab bench” area where experiments are performed by Spark!Lab staff, often dressed in white lab coats. Here visitors can look on and sometimes participate in a variety of demonstrations which take place hourly. The remainder of the main space houses various table (or floor) activities with accompanying instructions. Visitors are free to touch, manipulate, and interact with the pieces included in each activity as they wish. At the end of Spark!Lab nearest the entrance, the Under 5 Zone features age-appropriate materials and activities targeted toward younger children. Spark!Lab employees, parents, and children interact in all the spaces in the room.

Goals and Mission.

The Lemelson Center's mission is “to document, interpret, and disseminate information about invention and innovation...to encourage inventive creativity in young people...[and] to foster an appreciation for the central role of invention and innovation in the history of the United States.” To accomplish this mission, the Lemelson Center “records the past, by preserving and increasing access to records and artifacts[;] broadens our understanding of history, through research, discussion, and dissemination of ideas[; and] looks toward the future, by engaging young people in the study and exploration of invention and innovation.”² In keeping with the theme of invention in the nearby *Invention at Play* exhibition, Spark!Lab is meant to inspire visitors to carry out the essential steps of invention. These steps are presented as central themes that are connected to Spark!Lab's activities and displayed visually around the room:

- Identify a problem or need (Think it)
- Conduct research (Explore it)
- Make sketches (Sketch it)
- Build prototypes (Create it)
- Test the invention (Try it)
- Refine it (Tweak it)

¹ "About Spark!Lab: Smithsonian Lemelson Center." *About Spark!Lab*. Web. 10 Aug. 2010. <<http://invention.smithsonian.org/centerpieces/sparklab/spark-about.html>>.

² Smithsonian Lemelson Center. About the Lemelson Center. Web. 17 Aug. 2010. <<http://invention.smithsonian.org/about/>>

- Market the invention (Sell it)³

Past and Ongoing Changes in Spark!Lab.

The space that Spark!Lab currently occupies was previously the Hands On Science Center, which presented experiments and activities in connection with the adjacent exhibition *Science and American Life*. In spring of 2006, the lab's Director, Matthew White, called upon the Smithsonian's Office of Policy and Analysis to assess the Science Center's performance in a visitor study with the intention of redesigning the space. The Office of Policy and Analysis performed a mixed-methods study including interviews and observations of visitors, an exit survey, and a group interview conducted with docents and other Hands On Science Center staff. The 2006 study showed that visitors enjoyed the lab as a place that portrayed science as special and fun, and were also satisfied with many of the activities. However, results showed room for improvement in the areas of display, maintenance, and visibility. When Spark!Lab took over this space, the Lemelson Center team incorporated many suggestions from the Hands On Science Center study. Now a new analysis – on the verge of another period of transition and renovation – seeks once again to help Spark!Lab better pursue its mission and improve visitor satisfaction.

³ "About Spark!Lab."

III. Methodology

Data was collected using a paper survey distributed to visitors as they exited Spark!Lab. The instrument was designed to replicate many questions from the 2006 Hands On Science Center study, the better to compare visitors and their experiences over time. It included eight closed-ended questions about visitor demographics, satisfaction, group composition, length of visit, and whether the respondent had spoken with Spark!Lab staff during his or her visit.

Spark!Lab staff performed all data collection following an initial training session by the survey manager and OP&A staff. Twenty-five collection sessions, distributed evenly across varying days and times, were conducted over four weeks in July and August 2010. The intercept protocol involved asking one member of each visitor group (the first person over age five to pass a mark on the floor near the exit) to complete the survey. The survey sought to assess only voluntary visitors, so any respondents who reported being part of a school, camp, or other organized group were deemed ineligible and removed from the dataset – this was a change from the structure of the 2006 study. Since interviewers were instructed to intercept all groups, no sampling procedures were employed.

Data collection resulted in a dataset of 566 responses. The overall completion rate for valid responses was 79%. Surveys were edited and scanned, and data analyzed (using SPSS) and compiled for presentation (using MS Excel) by the survey manager; open-ended responses were added to the data set manually and analyzed using NVivo.

In addition to figures that appear in the body of this report, frequency tables of all survey findings for both the 2010 Spark!Lab study and its precursor, the 2006 Hands On Science Center study, appear in Appendices A and B.

IV. Key Findings: Survey Questions

Visitors are very satisfied with their Spark!Lab experiences.

The average satisfaction rating across all respondents was 8.29 on a 1-10 scale; the median rating was nine. Nearly 40% of all respondents rated their Spark!Lab visit at the top of the scale. More than four-fifths of all respondents rated Spark!Lab between 7 and 10.⁴

Overall, more visitors rated Spark!Lab at 10 than did Hands On Science Center visitors in 2006 (38% versus 34%). Large proportions of visitors of all ages did so, but the highest level of 10 ratings came from the youngest visitors (see Figure 1); even larger proportions of all visitors rate Spark!Lab between 7 and 10. As in 2006 (Figure 2), teens, aged 13-17, remain the least likely to rate their experience at 10. The highest ratings among both older children and teens have improved since then, though – by eleven and twelve percent, respectively – and ratings of 1-6 among teens have declined dramatically. Visitors over age 45 are also much happier now than in 2006.

Age	Rating 1-6	Rating 7-9	Rating 10	Total
5 to 8	17	30	53	100
9 to 12	18	42	40	100
13 to 17	23	49	28	100
18 to 34	25	45	30	100
35 to 45	15	53	32	100
over 45	4	50	46	100
All Visitors	18	44	38	100

Figure 1: Ratings – percentages by age, 2010

Age	Rating 1-6	Rating 7-9	Rating 10	Total
5 to 8	21	25	55	101
9 to 12	26	45	29	100
13 to 17	38	46	16	100
18 to 34	24	41	35	100
35 to 45	11	53	36	100
over 45	22	50	28	100
All Visitors	24	42	34	100

Figure 2: Ratings – percentages by age, 2006

⁴ See appendices for tables of all survey for both the 2010 Spark!Lab study and the 2006 Hands On Science Center study.

Visitors overwhelmingly enter Spark!Lab with their families.

Almost 89% of respondents visited Spark!Lab with family; the remainder reported visiting alone, with friends, or with more than one of these types of group.

Many Spark!Lab visitors are non-local.

Over one-quarter (28%) of Spark!Lab visitors reported living in Washington, D.C., Virginia, or Maryland. This rate of local visitation to Spark!Lab is considerably higher than to the museum as a whole, especially in the summer season. Two other surveys of all NMAH visitors around the same time in 2010 showed combined DC-Virginia-Maryland visitation of about 17%; Spark!Lab exceeds that pattern substantially.

As with Hands On Science Center in 2006, most visitors do not know of Spark!Lab before they see it.

Most visitors (71%) learned about Spark!Lab by noticing the space during their visit; only 10% each were either repeat visitors or had heard about Spark!Lab from some other source. The final 5% learned of Spark!Lab on the internet.

These percentages are nearly identical to findings from the 2006 Hands on Science Center report about the same space – at that time, 69% of visitors had seen the space while moving through the museum and 16% heard about it; 10% had visited before and 5% learned of HOSC online.

Overall, visitors spend less time in Spark!Lab than they did in HOSC.

The greatest plurality of visitors (40%) reported spending between 15 and 30 minutes in Spark!Lab, which is also the median reported time. This result is similar to the 2006 report, but the rest of the distribution has shifted to shorter visits (see Figure 3). While one-quarter of visitors reported stays of less than 15 minutes in 2006, nearly one-third did so in 2010. Slightly more than one-quarter reported spending more than 30 minutes in Spark!Lab, far fewer than in 2006.

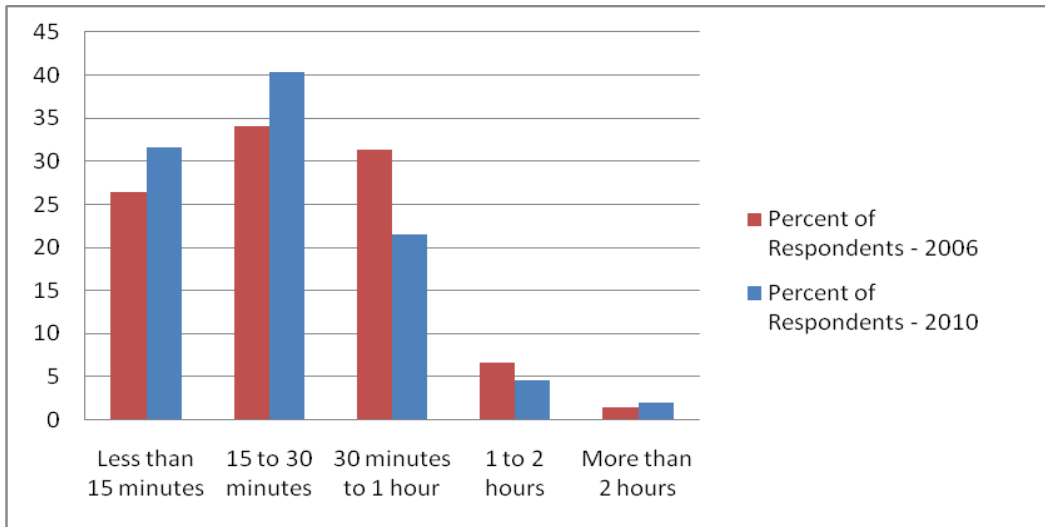


Figure 3: Time visitors reported spending in Hands On Science Center (2006) versus Spark!Lab (2010)

About half of visitors engage with Spark!Lab staff.

When asked, “During your time in Spark!Lab today, did you talk with anyone who works for the museum,” visitors responded relatively evenly: about 53% had interacted with staff (or volunteers) in Spark!Lab, while about 47% had not.

About half of Spark!Lab visitors are children between the ages of five and twelve.

Spark!Lab is designed for children up to age twelve, and the main activity area is intended for children ages 5-12. The median age of all respondents over the age of five is 13. This indicates the space is reaching its target audience relatively well. About one-quarter of respondents who provided their age (n=548) were between five and nine years old; another one-quarter were over the age of 37. (Adult ages ranged to 86; children under age five were ineligible to participate in the survey.)

Spark!Lab attracts more female than male visitors.

More female than male visitors completed the survey – 57% versus 41%. This is a slightly greater difference than the percentages of males and females in the museum during the time of the study. According to the 2010 Visitors Count! Survey of NMAH, visitors to the museum as a whole are 52% female and 48% male.

The preponderance of females over males was true across all age groups (i.e., for children, teens, and adults) and to the same degree within each age group. This was also the case in the Hands On Science Center study.

V. Key Findings: Visitor Comments

Visitors who wrote comments also stayed longer and interacted with more Spark!Lab staff.

Of 566 visitors who completed exit surveys, 216 included at least one open-ended comment on their survey. This discussion extracts particular themes from within comments or partial comments.⁵

There were only two main differences between the survey responses of comment-givers and respondents in general: greater length of visits and higher rates of staff interaction. While a similar plurality of this group – about two in five – stayed between 15 and 30 minutes, nearly 37% stayed more than 30 minutes (about one-quarter stayed less than 15 minutes). The opposite distribution appeared in the overall survey population. And while about 53% of all respondents reported speaking with Spark!Lab staff (or volunteers), nearly 60% of comment-givers did so.

Nevertheless, the open-ended responses that were collected form a body of ideas worth considering as Spark!Lab moves into its next incarnation.

Some visitors report enjoying Spark!Lab, and voice a desire for more of everything.

Comments were overwhelmingly positive or constructive. By far the largest group were generic, positive comments (e.g. “This was awesome,” “Thank you,” “We loved it,” etc.) that did not address any other specific content or viewpoint.

Additional comments called out specific activities, experiments, or materials for praise. In nearly every suggestion visitors made about things they *did* in the space, the demand was for an increase rather than a change. These comment writers generally said, as one nine year old boy put it, that Spark!Lab activities “need more stuff!” Suggestions ranged from that sentiment to the very specific, including “More pimpin' auto parts and duct tape” (from a 13 year old girl). Similarly, comments about Spark!Lab’s staff (and volunteers) affirm their skills as teachers and facilitators; the only staff-related suggestions involved requests that more be available.

Only a handful of comments dealt with specific parts of Spark!Lab’s physical layout – suggestions were about increasing adults’ comfort while they watched children at play, as well as “a higher platform” for better viewing of lab bench experiments.

While some visitors identify Spark!Lab as a place for hands-on fun and science, no comment-givers volunteered ideas about invention.

By far, the most frequent descriptions of Spark!Lab identify the space as a place for fun and for interactive or hands-on activity. These positive comments are markers of Spark!Lab’s mission-related success at engaging young

**Love hands on, creative,
structured and non-
structured activities.**

~ female visitor, 43

⁵ All text in this section that appears in quotation marks or pullout text is drawn verbatim from one or more visitors’ survey comments.

people in exploration. Some respondents also touched on the space as a venue for creativity and for play, and others remarked on learning in the space or finding something “interesting” – again, positive comments that point toward meeting visitors’ needs as an informal learning environment.

Such comments also align with Spark!Lab’s focus on invention and innovation. On the other hand, a number of visitors referred to the presence of “science” (and especially “chemistry”) in Spark!Lab – while none of the respondents who left written comments used any variation of the word *invent* or any phrases that seemed related to the idea of invention.

Some visitors feel Spark!Lab is for younger children than the current target audience.

Several visitors shared their thoughts on the ideal age range for Spark!Lab – either by describing what ages are best served by the activities, or by requesting more activities to suit certain ages. One twelve year old girl wrote, “I thought my 8-year-old brother would love this.” Another girl (who was herself eight years old) had the same idea, and suggested that Spark!Lab “need[s] something for kids 8-12 years.” Other comments from adults praised the main activities for children as young as age two.

My 12-year-olds had fun ... at the "bar" area – other stuff they thought was too young for them.

~ female visitor, 42

One adult, writing on a five-year-old’s survey, wondered if the main set of activities weren’t too complex for five-year-olds, and suggested adding “a fun interactive for them.”

Spark!Lab attracts local and non-local return visitors.

The comments also highlighted something found in the interview portion of this study – some Spark!Lab visitors return again and again. Several visitors indicated they had been to Spark!Lab before or that they planned to return. One 66-year-old man even wrote he would “have to come back by myself.”

We came 3 times during the past 2 days. Our daughter loved it & my wife & I learned [or] relearned a thing or two. Thank you

~ parent of a six-year-old girl

Specific visitor suggestions: enough time and space for access.

Comments that offered concrete suggestions generally fell into distinct categories: the requests for more materials and resources described above; comments about age-appropriateness, also above; and complaints or suggestions about the size and crowding of Spark!Lab’s physical space.

Some respondents cited timing-related issues, ranging from the infrequency of lab experiments to a desire for timed entry or time limits “to allow for other kids to come in & participate.” Other visitors commented on Spark!Lab’s small size and crowding issues as a function of space rather than time. These two themes together are by far the most frequently cited

[It] would have helped to have more of an intro to the space to build enthusiasm for the stations

~ female visitor, 31

problem visitors noted: the desire for greater time- and space-related access to Spark!Lab.

Other suggestions ranged widely. They included requests for new activities (including cooking and chemistry classes, and activities about space and black holes). A few suggestions focused on making existing activities better by offering more explanation or modeling of activities to “get [the] ball rolling.” Others were pointed requests for the status quo (“It is very fun and do not change it”).

VI. Discussion

Significant relationships between responses.

Of all the relationships between respondents' satisfaction with Spark!Lab and their other survey responses, only three showed a statistically significant correlation: length of visit, staff contact, and age. See Appendix C for tables showing the cross-tabulations of satisfaction ratings with responses to these three survey questions.

There is a strong, positive relationship between increased length of visit and increased satisfaction. This is consistent with the overall body of OP&A studies and visitor research in general. It also makes intuitive sense: visitors who stay in Spark!Lab (or any space) for more time consequently have more opportunity to find satisfying experiences there; visitors who remain satisfied are likely to stay longer in an area they enjoy. Similarly, visitors who reported speaking with Spark!Lab staff rated their experience at 10 nearly twice as often as those who did not (64% versus 36%). The opposite was true for those who rated Spark!Lab at the bottom of the scale – only 40% of those whose ratings were 1-6 reported staff contact.

Although these correlations may seem obvious, they have implications for the future of Spark!Lab. Overall visit length has declined since 2006, probably due to less emphasis on presentations at the lab bench, which points to a new challenge of offering highly satisfying experiences in more compressed amounts of time. Encouraging visitors' engagement with Spark!Lab staff also seems to be a reliable way to influence visitors' positive feelings about the space.

As described above in part IV, overall visitor satisfaction is very high – over 80% of all visitors rate their Spark!Lab visit at 7 or higher. Children aged twelve and under were most satisfied based on the frequency with which they rated Spark!Lab at 10. The relationship between age and satisfaction is not strictly linear, however. Ratings at 10 are strongest from children, then diminish among teens and young adults, then rebound among visitors aged 35 and over. Ratings at 1-6 follow the opposite pattern, peaking among adults 18-35 and then declining. This pattern indicates that many adult visitors, like children, appreciate Spark!Lab. It remains unclear whether adults' satisfaction stems from their own positive experiences or those of the children they accompany, but it is an encouraging sign nonetheless.

The length of a respondent's visit to Spark!Lab, whether or not they spoke with staff during the visit, and the respondent's age were all related to his or her satisfaction rating. Fortunately for the Lemelson Center, these variables also have practical significance. Each one presents concrete goals toward which Spark!Lab can move in order to increase visitors' satisfaction. Increasing staff contact, for example, might dramatically improve how visitors describe their Spark!Lab experiences.

While statistical significance makes these three variables appear the most pressing, all the findings of this study can be used to improve visitors' experience of Spark!Lab. The survey findings provide a specific (if partial) demographic profile of current visitors. Qualitative data from respondents' comments highlight both "quick fix" opportunities to prototype small changes and several fruitful avenues for future inquiry.

Part VII offers more specific recommendations based upon both sets of key findings described above and their inter-relationships.

VII. Recommendations

The 2010 Spark!Lab survey showed that visitor satisfaction is closely linked to the time spent inside and the high-quality interactions visitors have with staff; the quality and appeal of the activities also shined through. Most recommendations, then, deal with maximizing those conditions: getting visitors into the space and increasing their exposure to the good things Spark!Lab has to offer.

A few additional suggestions also point toward increasing Spark!Lab's profile, impact, and messaging.

Since so many visitors are in family groups, develop more ways to serve children of all ages.

There could be benefits to making activities more scalable in terms of complexity – both simpler activities for younger children, and more challenging ones for older kids and teens. A wider range of options will not only increase Spark!Lab's appeal; it will also help to better serve the target age range. Intact family groups (the vast majority of visitors) will be better able to engage with activities together, and for a longer time, since one or more unsatisfied family members would be less likely to draw the group away. The report for the Spark!Lab interview/observation study also explores this theme and offers more concrete suggestions.

Re-frame the pacing of Spark!Lab activities to suit visitors' shorter visits.

Overall, visitors are spending less time in Spark!Lab than they did in the Hands On Science Center. Improvements to Spark!Lab should strive to make shorter visits as satisfying as possible. Consider changes to accommodate the shorter-visit trend: lab bench experiments could be performed each half hour, for example, rather than hourly, exposing more visitors to a particularly satisfying experience.

Acknowledge and encourage the positive effects Spark!Lab staff and volunteers have on visitor experiences.

Both survey comments and the relationship between staff contact and satisfaction highlight Spark!Lab's staff and volunteers as important factors in visitor satisfaction. Continue to train for (and reward) the kind of engaging, positive interactions that staff create for visitors.

Continue to advocate for increased visitor space in the renovated Spark!Lab.

Lack of space, and corresponding feelings of being rushed or crowded, were the shortcomings most strongly (and frequently) pointed out by Spark!Lab visitors who left comments.

Promote Spark!Lab (both within and beyond NMAH) as a rare and successful family-friendly place on the Mall.

Spark!Lab is already a unique space, and has the potential to do an even better job of filling the special niche it occupies at the Smithsonian. If it wishes and if space permits, NMAH and the

Lemelson Center can leverage this position by more aggressively driving family traffic to Spark!Lab. At a time when several Smithsonian museums are also developing more hands-on, experiential spaces, Lemelson Center staff is uniquely positioned to advise their peers on the successful development of such spaces. Staff from other units should take advantage of the Spark!Lab team's experiences and institutional memory.

Pay attention to the Under 5 Zone – perhaps with further study.

One of the major constraints of this survey was that it did not include visitors under the age of five. The concurrent interview/observation studies, however, have pointed to a wealth of opportunity for exploring new ways to serve the youngest visitors.

In particular, it may be that preschool-aged children might be served equally well by the main set of Spark!Lab activities – especially if they are revised to include varying levels of complexity. This possibility is consistent with visitor comments that note the suitability of Spark!Lab for even younger audiences than it has been designed to serve.

Moreover, informal observations indicate that the “Under 5 Zone” activities might benefit from greater attention. One useful follow-up study, for example, might show whether they adequately serve the full range of developmental needs for all young children – infants, toddlers, and/or preschoolers. If nothing else, a review and renewed application of early childhood development or education literature would serve the space well.

Bring invention themes to the foreground.

Despite the mission (and best intentions) of the Lemelson Center, there was no indication that visitors were spontaneously making the connection between Spark!Lab, its hands-on structure and activities, and the ideas of invention and innovation.

This is a challenge that could be addressed by re-imagining the activities in the space. A new incarnation of lab bench experiments, for example, might be structured to present a problem, plus several different approaches that might solve the problem (with either a known “answer” or as an open-ended exploration). Such a structure might keep visitors from identifying Spark!Lab only with science, rather than scientific innovation.

The invention-related goals might be better served by another visual re-design as well, making the “Think it, Explore it, Sketch it, Create it, Try it, Tweak it, Sell it” graphic elements even more prominent and better integrated into the activity areas.

Appendix A: 2006 Survey Findings – Hands On Science Center

(Percentages of valid responses. Some totals do not equal 100% due to rounding.)

Age	"How old are you?"	
	Age	Percent
	5 to 8	24
	9 to 12	32
	13 to 17	14
	18 to 34	8
	35 to 45	16
	over 45	7
	Total	101

Average age between 5 and 21	10
Average age 21 and over	41

Visit Group	"Who are you in the museum with?"	
	Response	Percent
	School group	4
	Friends	5
	Family	88
	I'm alone	3
	Total	100

Information Source	"How did you know about the Hands On Science Center?"	
	Response	Percent
	Been here before	10
	Saw it	69
	Heard about it	16
	Internet	5
	Total	100

Sex	"What sex are you?"	
	Response	Percent
	Girl	55
	Boy	45
	Total	100

Residence	"Do you live in Washington, Virginia, or Maryland?"	
	Response	Percent
	Yes	26
	No	74
	Total	100

Length of Stay	"How long were you in the Hands On Science Center?"	
	Response	Percent
	Less than 15 minutes	26
	15 to 30 minutes	34
	30 minutes to 1 hour	31
	1 hour to 2 hours	7
	More than 2 hours	2
Total	100	

Rating	"How much did you like the Hands On Science Center Today?"	
	Response	Percent
	One ("Didn't like it")	1
	Two	1
	Three	3
	Four	1
	Five ("It's ok")	7
	Six	11
	Seven	10
	Eight	17
	Nine	15
	Ten ("Loved it")	34
	Total	100

Average rating 8

Rating Scale Equivalent	Scale	Percent
	Poor, Fair, Good (1-6)	24
	Excellent (7-9)	42
	Superior (10)	35
	Total	101

Appendix B: 2010 Survey Findings – Spark!Lab

(Percentages of valid responses. Some totals do not equal 100% due to rounding.)

Age

"How old are you?"

Age	Percent
5 to 8	17
9 to 12	30
13 to 17	9
18 to 34	11
35 to 45	25
over 45	9
Total	101

Visit Group

"Who are you at the museum with?"

Response	Percent
Friends	6
Family	89
I'm alone	1
Friends and family	3
Total	99

Information Source

"How did you know about Spark!Lab?"

Response	Percent
Been here before	10
Saw it	74
Heard about it	10
Internet	6
Total	100

Sex

"What sex are you?"

Response	Percent
Girl	57
Boy	41
Total	98

Residence

"Do you live in Washington D.C., Virginia, or Maryland?"

Response	Percent
Yes	28
No	72
Total	100

Length of Stay	"How long were you in Spark!Lab?"	
	Response	Percent
	Less than 15 minutes	32
	15 to 30 minutes	40
	30 minutes to 1 hour	22
	1 hour to 2 hours	5
	More than 2 hours	2
	Total	101

Staff Contact	"During your time in Spark!Lab today, did you talk with anyone who works for the museum?"	
	Response	Percent
	Yes	53
	No	47
	Total	100

Rating	"How much did you like Spark!Lab today?"	
	Response	Percent
	One ("Didn't like it")	1
	Two	1
	Three	1
	Four	2
	Five ("It's ok")	4
	Six	10
	Seven	11
	Eight	20
	Nine	13
	Ten ("Loved it")	39
	Total	102

Average rating 8

Rating Scale Equivalent	Scale	Percent
	Poor, Fair, Good (1-6)	18
	Excellent (7-9)	44
	Superior (10)	38
	Total	100

Appendix C: Cross-Tabulations of 2010 Survey Findings – By Satisfaction Rating (1-10)
 (Percentages of valid responses. Some totals do not equal 100% due to rounding.)

"How long were you in Spark!Lab?"

	Less than 15 minutes	15 to 30 minutes	30 minutes to 1 hour	1 to 2 hours	More than 2 hours	Total
1-6	65	24	8	1	1	99
7-9	35	48	16	1	0	100
10	12	40	34	10	5	101
All Visitors	31	41	22	5	2	101

(Statistically significant: $p < .001$)

**"During your time in Spark!Lab today, did
 you talk with anyone who works for the
 museum?"**

	No	Yes	Total
1-6	60	40	100
7-9	52	48	100
10	36	64	100
All Visitors	47	53	100

(Statistically significant: $p < .001$)

"How old are you?"

	5-8	9-12	13-17	18-34	35-45	46+	Total
1-6	17	32	12	16	21	2	100
7-9	12	28	9	11	30	10	100
10	23	31	6	9	21	10	100
All Visitors	17	30	9	11	25	9	101

(Statistically significant: $p = .003$)

Appendix D: One-Page Summary

Key Findings: Survey Questions

- Visitors are very satisfied with their Spark!Lab experiences.
- Visitors overwhelmingly enter Spark!Lab with their families.
- Many Spark!Lab visitors are non-local.
- As with Hands On Science Center in 2006, most visitors do not know of Spark!Lab before they see it.
- Overall, visitors spend less time in Spark!Lab than they did in HOSC.
- About half of visitors engage with Spark!Lab staff.
- About half of Spark!Lab visitors are children between the ages of five and twelve.
- Length of visit, staff contact, and age all correlate significantly with respondents' satisfaction.
- Spark!Lab attracts more female than male visitors.

Key Findings: Comments

- Visitors who wrote comments also stayed longer and interacted with more Spark!Lab staff.
- Some visitors report enjoying Spark!Lab, and voice a desire for more of everything.
- While some visitors identify Spark!Lab as a place for hands-on fun and science, no comment-givers volunteered ideas about invention.
- Some visitors feel Spark!Lab is for younger children than the current target audience.
- Spark!Lab attracts local and non-local return visitors.
- Specific visitor suggestions: enough time and space for access.

Recommendations

- Since so many visitors are in family groups, develop more ways to serve children of all ages.
- Re-frame the pacing of Spark!Lab activities to suit visitors' shorter visits.
- Acknowledge and encourage the positive effects Spark!Lab staff and volunteers have on visitor experiences.
- Continue to advocate for increased visitor space in the renovated Spark!Lab.
- Promote Spark!Lab (both within and beyond NMAH) as a rare and successful family-friendly place on the Mall.
- Pay attention to the Under 5 Zone – perhaps with further study.
- Bring invention themes to the foreground.