

**The Handheld Signing Math & Science Dictionaries for Deaf and Hard of Hearing
Museum Visitors Research Project: A Sub-study Conducted with Families at the Harvard
Museum of Natural History**

(NSF, Grant #DRL-1008546)

TERC

by

Judy Vesel, Principal Investigator

Bill Nave, Project Evaluator

Tara Robillard, Lead Researcher

April 2015

SUB-STUDY DESCRIPTION

With this project, TERC and the Museum of Science (MoS) Boston are studying how family and school visitors integrate iPod Touch versions of the Signing Science Pictionary (SSP), Signing Science Dictionary (SSD), and Signing Math Dictionary (SMD) into their museum experience and the impact of dictionary use. This report focuses on a pilot test involving family visitors to the Harvard Museum of Natural History (HMNH). Prior to this sub-study, TERC and the MoS conducted a primary study that examined use of the dictionaries at the MoS¹. Findings from this study showed the following:

- Visitors used the signing dictionaries to learn the signs and definitions for terms that were new to them as they visited each of two exhibit areas.
- Family groups engaged in discussions about the activities they visited. The new signs they learned from using the dictionaries were used to support these discussions.
- Family members reported that they used the dictionaries to learn signs and definitions for terms that were new to them more frequently at activities where Word Lists that included key dictionary terms were posted.

Additionally, many participants indicated that they would be interested in using the signing dictionaries during another visit to the MoS or to a different informal science setting such as a zoo or aquarium. This prompted the researchers to identify a museum in close proximity to TERC to continue to examine family use of the dictionaries in museum settings. The HMNH was selected for this ongoing work as it is close to TERC's location in Cambridge, MA and offers opportunities to investigate the use of the dictionaries in a different type of science museum setting.

The exhibits chosen for testing with families at the MoS included several activities that required visitors to actively engage in science inquiry, read instructions, follow steps, and interact with phenomena. These kinds of exhibits are typical of those included in a science museum. Exhibits at the HMNH— which are typical of those at most natural history museums— feature collections of displays of specimens and artifacts. Permanent galleries focus on dinosaurs, fossil invertebrates, reptiles, large mammals, birds, and fish. The wide array of preserved organisms— and few that are live— from around the world, offer visitors opportunities to observe and get a “close up” look at the diversity of life. Many of the exhibits focus on topics that afford opportunities for visitors to use the dictionaries to help them access text information presented in panels, notice particular features, and communicate about their experiences. Therefore, by selecting the HMNH for this sub-study, the researchers were able to further investigate several of the findings from the primary MoS study. This also made it possible to begin to determine how use of the signing dictionaries and outcomes of use compare to the key findings made at the MoS.

OBJECTIVES and GOALS

Findings from prior studies conducted at the MoS begin to show how families used the dictionaries in situations that involve physical interaction with phenomena and what kinds of supports were needed. For this sub-study, we began to examine how family visitors use the dictionaries in a setting in which interactions with the phenomena are primarily observational

¹ Vesel, J., Nave B. & Robillard, T. (2014). *Evaluation report: The Handheld Signing Math & Science Dictionaries for Deaf and Hard of Hearing Museum Visitors Research Project. Field Test Evaluation Report: School Visitors.* Unpublished report. Posted at http://signsci.test.terc.edu/MoS_SMSD/reports/index.htm

using supports that are similar to those used successfully at the MoS. To accomplish this, the goals of the evaluation were to collect data to answer the following two primary research questions:

- 1) How do family visitors use the use the signing dictionaries during their exploration of a natural history museum exhibit area in which interactions are primarily observational?
- 2) To what extent does having access to signed science vocabulary during exploration of a natural history museum exhibit area contribute to visitors being engaged in seeking evidence, noticing patterns, and making inferences about organisms and groups of organisms?

Our hypotheses were that visitors will use the vocabulary included in the dictionaries to help them engage in practices of scientific inquiry that help them find out about individual arthropods and groups of arthropods.

METHODOLOGY

The pilot test used a mixed methods design that integrated quantitative and qualitative methods. Data was collected from two groups of family visitors before they visited the Museum, during their visit to the Arthropods exhibit area, and after their visit. The Arthropods exhibit area was selected for the sub-study because it includes information about live and preserved organisms and incorporates many of the terms that are included in the dictionaries. Examples are: lobster, crustacean, exoskeleton, and ocean. It was also selected because it includes many of the common organisms often encountered by families living in New England. These data included observations, exit interviews and a follow-up survey with fixed-response and open response items. The protocols for the evaluation are described below.

Pre-visit Protocols. Prior to visiting the museum, Parents completed a *Family Information Form* that provides demographic information about factors such as age, hearing level, and signing ability of each participant.

Visit Protocols. Before each family arrived at the museum, the researcher affixed Word Lists to some of the kiosks in the Arthropods exhibit area, which had been pre-selected as the target area for the stub-study. The Word Lists included key terms related to components of the exhibit that are also in the dictionaries. As shown in Figure 1, the lists included names of organisms and terms related to characteristics or habitat.

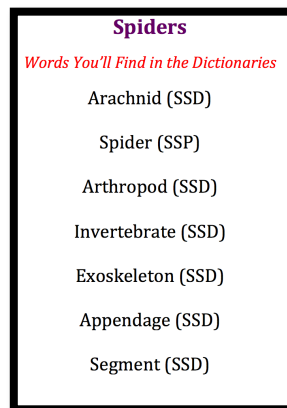


Figure 1. Word List Posted on the Kiosk Containing Spiders

Upon the arrival at the Arthropods exhibit, the researcher met with the family. She first gave each family member an iPod with the dictionaries loaded onto it and then went over the procedures for looking up terms and operating the dictionary features. She also explained that Word Lists had been attached to some of the kiosks and that they include key terms related to components of the exhibit that are also in the dictionaries, such as names of organisms and terms related to characteristics or habitats. The family was then instructed to explore the exhibit area using the Word Lists and signing dictionaries. As the family explored the exhibit area, the researcher observed them. She recorded information about their actions and interactions on an *Observation Log* and also took photographs and made video recordings. She paid particular attention to terms they looked up, dictionary features they used, and actions and conversations that took place before, during, and after dictionary use.

After the family completed their exploration of the exhibit, the researcher met with the family and conducted an exit interview with the deaf or hard of hearing children using an *Exit Interview Form for Children*. This was followed by an exit interview with parents using an *Exit Interview Form for Parents*. Following the interviews, the researcher invited the family to explore the remainder of the museum using the dictionaries if they would like to do so.

Post-visit Protocols. Before leaving, the researcher met with the family, collected the iPods, and explained that she would be sending parents a link to an online *Follow-Up Survey* that they were to complete within two weeks of the visit.

Copies of the instruments are included in the Appendix.

DATA PREPARATION AND ANALYSIS

The data sources provided a robust data set to support an analysis intended to answer our research questions. Data collected were analyzed as follows:

- Identifiers were removed from the instruments and a numerical tracking system for tracking data was implemented.
- Exit interviews were transcribed, and all data was organized and entered into spreadsheets for analysis.
- Quantitative data were tallied and calculated into percentages. For example, tallies and percentages of terms that visitors looked up in the dictionaries (and why), dictionary features visitors used, and Likert-scale responses to questions about ease of dictionary use and value added, provided descriptive information about family use of the dictionaries during exploration of a natural history museum exhibit area.
- Qualitative data were analyzed to add context to, and deepen the quantitative findings. To this end, the researcher manually coded responses to open-ended questions, interview responses, and observational data using inductive coding procedures to identify themes and patterns related to how (in what ways) visitors engaged in seeking evidence, noticing patterns, and making inferences about organisms and groups of organisms.

Specifically, with regard to coding behaviors, comments and responses, we attempted to identify and group together examples of instances where, with use of the dictionaries, family members sought evidence, noticed patterns, and/or made inferences. By looking at the patterns

and themes that emerged, we gained valuable insight into the ways in which having access to signed science vocabulary during exploration of a natural history museum exhibit area contributes to visitors being engaged in these practices.

For example, if parents and/or children looked up one or more terms as they observed an organism or particular groups of organisms, they may have been engaged in the practice of seeking evidence. If family members were observed (or they mentioned) comparing and contrasting features and characteristics of organisms within and among the groups, this would be an example of noticing patterns. Making inferences is something that is not easily observed. However, the researcher used targeted questions during the exit interview to clarify or find out more about the kinds of inferences family members appeared to have made during and following their explorations.

In cases where the researcher observed behaviors or heard comments that may have been examples of one of the three practices, she attempted to clarify and find out more about visitors' motivations, reasoning, and outcomes related to their observed behaviors and actions by asking specific questions during the exit interviews and/or analyzing responses to follow-up survey questions.

VISITOR DEMOGRAPHICS

Two families participated in the sub-study. As described in Table 1, this included eight family group members, four adults (two mothers, a father, and a teacher) and four children (four girls, two of whom are deaf). Both groups participated in the prior study conducted at the MoS.

Table 1. Family Visitor Demographics

Group	N	Members	Gender	Age	Hearing Status	Hearing Loss	Signing Skills
A	3	Father Mother <i>Child 1</i>	M F <i>F</i>	<i>8</i>	Hearing Hearing <i>Deaf</i>	None None <i>Profound</i>	Novice Advanced <i>Survival</i>
B	5	Mother Teacher <i>Child 1</i> Child 2 Child 3	F F <i>F</i> F F	<i>13</i> 13 19	Hearing Hearing <i>Deaf</i> Hearing Hearing	None None <i>Profound</i> None None	Intermediate Superior <i>Intermediate</i> Intermediate Intermediate

RESULTS

Research Question 1: *How do family visitors use the use the signing dictionaries during their exploration of a natural history museum exhibit area in which interactions are primarily observational?*

Observation, exit interview, and follow up survey data provided the evidence for these results. With regard to the way in which the families experienced the exhibit area, Group A chose to visit each of the kiosks together as a group. Group B explored some of the kiosks together, but also split up and explored the space in small groups or pairs, at times checking in with one another. Although they explored the exhibit area differently, both groups spent time at several of the kiosks containing different groups of Arthropods, and used the signing dictionaries

to look up terms that they were interested in learning about. This included terms that were listed on the Word Lists, as well as those that were not included on the lists. Participants used the signing dictionaries for several different purposes as they explored the exhibit area. They looked up terms together as a group to learn new signs or see terms signed, to learn more about organisms or groups of organisms, and to be able to talk about what they were observing. The parents and the teacher looked up words to be able to ask their child questions about what they were observing, help them learn something new, extend their learning, or answer their questions. Occasionally, individual members of the group used the signing dictionaries to look up terms on their own for different reasons.

Observing family group dictionary use in the exhibit area provided information about which kiosks groups chose to visit, how long they spent at each, which terms they looked up, and what they did with the information that they acquired by observing the organisms and using the dictionaries. Specific information about how Group A family visitors used the dictionaries in the Arthropods exhibit area is provided in Table 2. Information about Group B is included in Table 3.

Table 2. Group A Exhibit Area Observations

Kiosk	Time Spent (minutes)	Kiosk w/ Word List?	Used Word List?	Words Looked Up	Used the ASL Sign?	Engaged in Discussion?
Tree of Life Wall	8	Yes	Yes	Invertebrate; Ancestor	Yes	Yes
Crabs and Lobsters	5	Yes	Yes	Crab	Yes	Yes
Spiders	8	Yes	Yes	Arachnid; Arthropod; Exoskeleton	Yes	Yes

Table 3. Group B Exhibit Area Observations

Kiosk	Time Spent (minutes)	Kiosk w/ Word List?	Used Word List?	Words Looked Up	Used the ASL Sign?	Engaged in Discussion?
Tree of Life Wall	7	Yes	No	Grasshopper*	No	No
Insects	4	Yes	No	Metal*	Yes	Yes
Crabs and Lobsters	4	Yes	Yes	Lobster; Exoskeleton	Yes	Yes
Butterflies	2	No	N/A	None	No	No
Cockroaches	3	No	N/A	Unknown	No	No
Fossils	5	No	N/A	Fossil	Yes	Yes
Parasites	5	No	N/A	Parasite	Yes	Yes

*Not a Word List Term

Research Question 2: *To what extent does having access to signed science vocabulary during exploration of a natural history museum exhibit area contribute to visitors being engaged in seeking evidence, noticing patterns, and making inferences about organisms and groups of organisms?*

Analysis of family visitors' behaviors, comments, and responses provided insight into the ways in which having access to signed science vocabulary during exploration of a natural history museum exhibit area contributes to visitors being engaged in practices associated with science

inquiry. As illustrated in Tables 2 and 3 above, each of the two family groups visited several kiosks in the Arthropods area, used the dictionaries to look up terms associated with the organisms that they were observing, and then engaged in a discussion. Their comments and discussions following dictionary use at kiosks in the Arthropods exhibit area provided information about the nature of the discussions that families engaged in, and the practices of science inquiry that they exhibited. Results for each of the two unique family groups follow.

Group A

For Group A, the young deaf child primarily used the signing dictionaries to look up words on the Word Lists. Since she had recently learned very early literacy skills such as recognizing letters and spelling words with two or three letters, her approach was to identify words on the Word Lists, type the words into the search, and then watch the Avatar sign the term. This sometimes led to discussion among the members of the group related to the observations being made and the information being accessed in the signing dictionaries. Summaries of these discussions, and the science inquiry practices that they exhibit, are included in Table 4 below.

Table 4. Group A Kiosk Discussions

Kiosk	Discussion	Science Inquiry Practices Exhibited
Tree of Life Wall	The child looked up the term <i>invertebrate</i> and watched the Avatar sign the term. Then she looked to her mother to explain the term. After saying that it is 'kind of tricky' to explain, the mother pointed to the child's spine and said, "You have it (running her hand down her back), but an <i>invertebrate</i> means an animal that doesn't have one." Then, the mother pointed to the organisms displayed on the wall and said, "These things don't have a backbone." "They are all invertebrates."	<ul style="list-style-type: none"> • Seeking evidence - looked up term in connection with observing organism(s). • Noticing patterns – "all animals displayed are invertebrates" • Making inferences – "you have a back bone but invertebrates do not".
Crabs and Lobsters	The child looked up the term <i>crab</i> and watched the Avatar sign the term. Then mother said, "Can you find the <i>crab</i> (using the sign that the child had just learned)." Then the child pointed to the crab in the case and the mother said, "Yay, yes there is the crab!"	<ul style="list-style-type: none"> • Seeking evidence - looked up term and identified the organism.
Spiders	The child looked at the Word List and chose a term to look up. She was very insistent on "doing it herself" by typing the term into the search box and locating it in the dictionary. She looked up <i>Arachnid</i> first and then, <i>Arthropod</i> watching the Avatar sign both terms. Then she looked up <i>exoskeleton</i> and turned the iPod to show her parents the sign. The mother tried to explain that an <i>exoskeleton</i> is a "skeleton on the outside." She said to the child, "You have a skeleton inside your body, but all of these animals have their skeleton on the outside." Then, all family members practiced the sign for <i>exoskeleton</i> .	<ul style="list-style-type: none"> • Seeking evidence - looked up several terms in connection with observing organism(s). • Noticing patterns - "all of these animals have their skeleton on the outside". • Making inferences – "you have a skeleton inside your body, but all of these animals have their skeleton on the outside."

Group B

Group B was a larger group that consisted of hearing family members, a teenaged deaf child, and the child's hearing middle school teacher. The hearing mother said that her main goal for using the dictionaries in the natural history museum was to build her own signing vocabulary. She said that her deaf daughter primary used the dictionaries to "connect" what she was seeing

with signed vocabulary. This group used the Word Lists at some kiosks, but also visited kiosks without Word Lists and used the dictionaries to look up terms of interest. On more than one occasion, the group members would discuss the sign for a term and compared and contrasted it with the sign for the term that they used or were familiar with. For several of the kiosks, the mother and daughter broke away from the group and used the dictionaries to look up terms and discuss their observations on their own. Summaries of this group’s discussions and the science inquiry practices that they exhibit are included in Table 5.

Table 5. Group B Kiosk Discussions

Kiosk	Discussion	Science Inquiry Practices Exhibited
Tree of Life Wall	The mother looked at the wall and said to her daughter, “Do you see my favorite?” The girl looked at the organisms on display on the wall and signed <i>crab</i> . The teacher approached looking at the specimens on her own. She looked up <i>grasshopper</i> and viewed the sign and definition.	<ul style="list-style-type: none"> • Seeking evidence - looked up term in connection with observing organism(s).
Insects	Looking at the beetles in the display case, the mother said, “These are pretty! Look at all of the different colors.” The mother commented on how they “look like metal.” Several members of the group looked up <i>metal</i> and practiced/used the sign. Other family members commented about the shape of the “noses” and “pinchers” of the beetles and how they are similar and different.	<ul style="list-style-type: none"> • Seeking evidence - looked up term and used it to describe a feature of the organism being observed. • Noticing patterns - discussed similarities and differences in features of the organism.
Crabs and Lobsters	The mother and deaf child looked at the Word List and the mother said, “Lobster - we know the sign for lobster. Should we check what sign the dictionary has?” They looked up <i>lobster</i> , viewed the sign and agreed that it was similar to the one that they use. Then the deaf child looked up <i>exoskeleton</i> . While viewing the sign the mother said (pointing to the organisms in the display case), “What (in this case) has an exoskeleton?” Then the deaf child signed, “All of them.”	<ul style="list-style-type: none"> • Seeking evidence - looked up several terms in connection with observing organism(s). • Noticing patterns - all animals in the case have an exoskeleton.
Fossils	The deaf child sat down at the case and started using the magnifying glass to look at the fossils in the case. Then her mother sat down across from her and they begin to have a conversation about the fossils they were viewing. The mother pointed out one that looked like a “baby lobster.” She talked about seeing lobsters and crabs at the beach on Cape Cod. The teacher approached and the group looked up terms and had a brief conversation about the signs for <i>lobster</i> and <i>shrimp</i> .	<ul style="list-style-type: none"> • Seeking evidence - looked up term in connection with observing organism(s).
Parasites	Several members of the group looked up the term “parasite” and then had a discussion about the sign. They were surprised there was a sign for the term in the dictionary. They discussed the slight differences in how they each sign the term.	<ul style="list-style-type: none"> • Seeking evidence - looked up term in connection with observing organism(s).

As evidenced by the discussions that took place following dictionary use, both groups often used the information from the dictionaries to “start a conversation” about what was being

observed. The practice of looking up one or more terms as they observed an organism or particular groups of organisms in this way, suggests that the visitors were engaged in the practice of seeking evidence. The parents of the deaf child in Group A were able to answer their child's questions and clarify the meaning of terms that the child had learned how to sign, while also connecting that new information to what was being observed. Members of Group B were able to use the dictionaries to build their signing vocabulary and connect names of organisms and their features with signed terms. For both groups, several of the interactions and discussions included behaviors or comments that demonstrated the practices of noticing patterns and making inferences about the organisms that were being observed, and their characteristics.

Additionally, responses to the follow-up survey provided information about how the families used the dictionaries throughout the museum. Both families mentioned that they often used the dictionaries to look up words used to “describe” what they were observing. For example, the deaf child in Group A looked up terms such as *tiny* and *dark* to help her explain to her parents what she was seeing. She would find these descriptive words in the dictionary, turn the iPod to show the signed term to her parents, and then point to what she was looking at. In one of the exhibit areas that displayed an animal skeleton, the child looked up the term *dig*, and signed to her parents (showing them the signed term and pointing to the skeleton), “They found all of these bones by digging.”

DISCUSSION

Key Findings. Although this study included only two families with deaf and hard of hearing children, it revealed some encouraging findings regarding exploration of a natural history museum while having access to signing dictionaries.

The results of this study were similar to those of the primary study at the MoS as follows: Family visitors used the signing dictionaries to learn the signs and definitions for terms that were new to them as they explored the exhibit area. They engaged in discussions about the activities they visited, and the new signs and information they learned from using the dictionaries were used to support their discussions. Family members also utilized Word Lists that included key dictionary terms and found them valuable in helping them identify key terms related to the organisms that they were observing.

However, examining how family visitors used the dictionaries in a setting in which interactions with the phenomena were primarily observational using supports that were similar to those used at the MoS also resulted in new information about the extent to which having access to signed vocabulary contributes to visitors being engaged in seeking evidence, noticing patterns, and making inferences about organisms and groups of organisms. While the data collected represents the experiences of only a few families, in only one exhibit area, it does begin to show that family groups can and do use the signed vocabulary included in the dictionaries to help them engage in practices of scientific inquiry that help them find out about the organisms and groups of organisms being observed.

Limitations of the Study. The results of this study reflect the experiences of only two family groups. Therefore they cannot be generalized to all families with deaf or hard of hearing children. It is also important to note that the study was conducted in one exhibit area, in a single informal educational setting, and using a limited number of kiosks within the single exhibit area. Therefore, a larger scale, study is required. This larger study should include more participants,

take place in an expanded number of exhibits in the natural history museum setting, and include additional data collection methods.

Appendix

Family Information Form

Part I. Parent/Guardian Information (Please complete for all parents/guardians who will visit the HMNH)

1. Name: _____

2. Please specify your hearing status.

- Hearing Deaf Hard of Hearing

Please specify your level of hearing loss.

- Mild (27–40dB)
 Moderate (41–55dB)
 Moderate - Severe (56–70dB)
 Severe (71–90dB)
 Profound (91dB+)

Please specify your age of onset of hearing loss.

- Age of onset < 3 years
 Age of onset > 3 years

3. Please specify your ethnicity.

- American Indian/Alaskan Native
 Asian American
 African American/Black
 Latino/Hispanic
 American Indian/Alaskan Native
 White
 Other: _____

4. Please check each of the language, communication, or sign system(s) that you use.

- Spoken English
 Spoken Spanish
 American Sign Language
 Signing Exact English
 Fingerspelling
 Simultaneous Communication (sign-supported speech)
 Manually Coded English Systems
 Cued Speech

Guide to Sign Communication Proficiency Levels

Superior: Able to have a fully shared conversation, with in-depth elaboration for both social and work topics.

Advanced: Able to have a generally shared conversation with good, spontaneous elaboration for both social and work topics.

Intermediate: Able to discuss with some confidence routine social and work topics within a conversational format with some elaboration; generally 3-to-5 sentences.

Survival: Able to discuss basic social and work topics with responses generally 1-to-3 sentences in length.

Novice: Able to provide single sign and some short phrase/sentence responses to basic questions signed at a slow-to-moderate rate with frequent repetition and rephrasing.

No Functional Skills: (May be) Able to provide short single sign and “primarily” finger-spelled responses to some basic questions signed at a slow rate with extensive repetition and rephrasing.

5. Please specify your Sign Communication Proficiency Level.

- Superior
 Advanced

- Intermediate
- Survival
- Novice
- No Functional Skills

Part II. Child Information (Please complete for all children who will visit the HMNH. If you have more than 2 children, complete an additional form.)

1. Name: _____ Age: _____

2. Is this child:

- Hearing
- Deaf
- Hard of Hearing?

If deaf/hh, does the child have:

- Cochlear Implant(s)?
- Hearing Aid(s)?

If deaf/hh, please specify level of hearing loss (with a CI and/or hearing aid, if applicable).

- Mild (27–40dB)
- Moderate (41–55dB)
- Moderate - Severe (56–70dB)
- Severe (71–90dB)
- Profound (91dB+)

Please specify the age of onset of hearing loss.

- Age of onset < age 3 years
- Age of onset > age 3 years

3. Does this child have a disability in addition to, or other than being deaf/hh?

- Yes
- No

If yes, please describe:

4. Please specify this child's ethnicity.

- American Indian/Alaskan Native
- Asian American
- African American/Black
- Latino/Hispanic
- American Indian/Alaskan Native
- White
- Other:

5. Please specify this child's ability to read and write English:

- Below grade level
- At grade level
- Above grade level

6. Please check each of the language, communication or sign system(s) that this child uses.

- Spoken English
- Spoken Spanish
- American Sign Language
- Signing Exact English
- Fingerspelling
- Simultaneous Communication (sign-supported speech)
- Manually Coded English Systems
- Cued Speech

7. Please specify this child's Sign Communication Proficiency Level.

- Superior
- Advanced
- Intermediate
- Survival
- Novice
- No Functional Skills

8. Please specify the school/program this child attends.

- Public/Private School
- School for the Deaf/HH
- Preschool/Pre-K

Name of School/Program: _____ Grade: _____

Part 3. Getting Started

1. Has your family visited the HMNH before?

- Yes No

If yes, please tell us about any particular challenges or obstacles that you may have experienced during prior visits.

2. Has anyone in your family used either the Web or App versions of the Signing Math and Science dictionaries at home or at school?

- Yes No

If yes, please tell us about your prior use of the dictionaries.

Exit Interview Form for Children

1. Did you like using the dictionaries? Did having the dictionaries help you explore this exhibit area? (Give an example. How did it help?)
2. Did you use the dictionaries to look up any words? (Which words did you look up? How did you decide which words to look up? Give some examples.)
3. How did you use the dictionary when you looked up words? (ASL/SE term and/or definition, read text term and/or definition?)
4. I noticed that over there _____ (identify kiosk/area) you (and/or your parent) looked up the word _____. Could you tell me about that? [Repeat the question based on observations].
5. What do you think about using the dictionaries during the visit?

Exit Interview Form for Parents

1. Did you like using the dictionaries? Did having the dictionaries help you to explore this exhibit area? (Give an example. How did it help?)
2. Tell me how you used the dictionaries?
 - What prompted you to look up words?
3. Which features did you use most frequently? (ASL/SE term and/or definition, read text term and/or definition.)
4. Did you look at or use the Word Lists? (Yes or No). If yes, how were the Word Lists helpful?
5. What do you think about using the dictionaries during the visit?
6. I noticed that over there _____ (identify kiosk/area) you (and/or your child) looked up the word _____ in the dictionary. Could you tell me about that? [Repeat the question based on observations].
7. Do you think it would be helpful to have access to the dictionaries during subsequent visits to this museum or to other types of museums such as an aquarium? [Can you tell me more about that?]

Observation Log

<p>Tree of Life Wall</p> <p>Start: ____ End: ____</p>	<p><u>Who Observed?</u></p>	<p><u>Terms/Looked Up?</u></p>	<p><input type="checkbox"/> Looked at/use the Word List? <input type="checkbox"/> Revisit or refer to prior organisms/groups of organisms?</p> <p>Use info from dictionary to: <input type="checkbox"/> - discuss <input type="checkbox"/> - teach or answer questions <input type="checkbox"/> - practice or learn sign(s)</p>	<p><u>Discussion/Action:</u></p>
<p>Hexapoda (Insects)</p> <p>Start: ____ End: ____</p>	<p><u>Who Observed?</u></p>	<p><u>Terms/Looked Up?</u></p>	<p><input type="checkbox"/> Looked at/use the Word List? <input type="checkbox"/> Revisit or refer to prior organisms/groups of organisms?</p> <p>Use info from dictionary to: <input type="checkbox"/> - discuss <input type="checkbox"/> - teach or answer questions <input type="checkbox"/> - practice or learn sign(s)</p>	<p><u>Discussion/Action:</u></p>
<p>Crustacea (Crustaceans)</p> <p>Start: ____ End: ____</p>	<p><u>Who Observed?</u></p>	<p><u>Terms/Looked Up?</u></p>	<p><input type="checkbox"/> Looked at/use the Word List? <input type="checkbox"/> Revisit or refer to prior organisms/groups of organisms?</p> <p>Use info from dictionary to: <input type="checkbox"/> - discuss <input type="checkbox"/> - teach or answer questions <input type="checkbox"/> - practice or learn sign(s)</p>	<p><u>Discussion/Action:</u></p>
<p>Myriapoda (Millipedes & Centipedes)</p> <p>Start: ____ End: ____</p>	<p><u>Who Observed?</u></p>	<p><u>Terms/Looked Up?</u></p>	<p><input type="checkbox"/> Looked at/use the Word List? <input type="checkbox"/> Revisit or refer to prior organisms/groups of organisms?</p> <p>Use info from dictionary to: <input type="checkbox"/> - discuss</p>	<p><u>Discussion/Action:</u></p>

			<input type="checkbox"/> - teach or answer questions <input type="checkbox"/> - practice or learn sign(s)	
<p>Chelicerata (Arachnids)</p> <p>Start: _____ End: _____</p>	<u>Who Observed?</u>	<u>Terms/Looked Up?</u>	<input type="checkbox"/> Looked at/use the Word List? <input type="checkbox"/> Revisit or refer to prior organisms/groups of organisms? Use info from dictionary to: <input type="checkbox"/> - discuss <input type="checkbox"/> - teach or answer questions <input type="checkbox"/> - practice or learn sign(s)	

Follow-up Survey for Families

1. Please provide your name so that we can match responses to your information on the family information form.
2. How easy was it for you to use the dictionaries?
 - Easy
 - Difficult
 - Comments:
3. How informative was the information in the dictionaries?
 - Informative
 - Not Informative
 - Comments:
4. How useful were the dictionaries during your visit to the museum?
 - Useful
 - Not Useful
 - Comments:
5. Rate how useful each of the following dictionary features was for you (Useful, Not Useful, Not Sure, Never Used).
 - a) SEARCH feature
 - b) Alphabet Bar
 - c) Alphabetical listing of terms
 - d) Parts of Speech
 - e) Definitions
 - f) Illustrations/Examples
 - g) Choice of ASL or SE
 - h) Signing Blocks of Text
 - i) Signing Individual Words
 - j) Human Voice Narration
 - k) Going to Terms Within Definitions
 - l) Changing Signing Speed
 - m) Changing Text Size
 - n) Changing Signing Character
 - o) Rotating Character
 - p) Zooming Character In and Out
6. Which of the following best describes the way your family experienced the exhibits at the museum?
 - a) We did most of the activities within exhibit area together.
 - b) We split up and explored individually, checking in at times.
 - c) Both a and b
 - d) Other (please describe):
7. Which of the following best describes the way your family used the dictionaries at the museum?
 - a) We looked up words to learn new signs or see terms signed.
 - b) We looked up words to learn more about organisms or groups of organisms.
 - c) We/I (parents) looked up words to help my child(ren) learn something new, extend their learning, or answer their questions.
 - d) We/I (parents) looked up words to be able to ask my/our child questions about what they were observing.
 - e) Each of us used the iPods individually to look up terms on our own for different reasons.
 - f) We/I looked up terms to learn more about or be able to talk about and explain what we were observing.
 - g) We/I looked up terms to help us/me understand the instructions or information presented in writing (on signs).
 - h) We looked up words to learn what they mean, understand instructions, and /or communicate in English.

8. Which of the following were most helpful/useful for you?
- Terms in SE
 - Terms in ASL
 - Terms in English
 - Definitions in SE
 - Definitions in ASL
 - Definitions in English
- Please explain your choice(s):
9. Which of the following were most helpful/useful for your deaf/hh child(ren)?
- Terms in SE
 - Terms in ASL
 - Terms in English
 - Definitions in SE
 - Definitions in ASL
 - Definitions in English
- Please explain your choice(s):
10. How useful were the posted Word Lists in helping you use the dictionaries?
- Useful
 - Not Useful
 - Comments:
11. Did you or your children use the dictionaries to learn new signs? If so, please list the terms for which you learned signs.
12. Did you or your children use the dictionaries to learn the meaning of a term that you did not know or that you were not sure about? If so, please give an example.
13. Did you or your children use the dictionaries to learn something that you didn't know before? If so, please give an example.
14. Rate how much you agree/disagree with the following statements (Strongly Agree, Agree, Disagree, Strongly Disagree).
- Using the dictionaries during the visit made it more fun.
 - Using the dictionaries during the visit made it easier.
 - Using the dictionaries during the visit gave us better access to the exhibits.
 - Using the dictionaries during the visit helped us learn more about science.
 - Using the dictionaries enhanced our museum experience (We "got more out of it").
 - Using the dictionaries during the visit helped our child(ren) explore and learn on their own (reduced the amount of help/instruction needed from parents).
15. Would you like to use the dictionaries during visits to other exhibits at the museum?
- Yes
 - No
16. Would you like to use the dictionaries during visits to other museums, zoos, aquarium, etc?
- Yes
 - No