# *Zoo in You: The Human Microbiome/ El microbioma humano*

*A Summative Evaluation Report*

**Prepared for**

OMSI
OREGON MUSEUM OF SCIENCE AND INDUSTRY


**by:**

Steven Yalowitz, Ph.D.
Erin Wilcox, M.A.
Audience Viewpoints Consulting



**With the generous support from**

NIH National Institutes of Health
Turning Discovery Into Health

SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
SUPPORTED BY THE NATIONAL INSTITUTES OF HEALTH


This project was supported by grant number 1R25RR032210-01, from the National Center for Research Resources, National Institutes of Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NCRR or NIH.

# Table of Contents

## List of Tables

# Executive Summary

### Background

The National Institutes of Health (NIH) awarded OMSI funding during the spring of 2011 to create a 2,000 sq. ft. bilingual (English/Spanish) traveling exhibition exploring current research on the human microbiome and the impact of our resident microorganisms on our health. The exhibition was developed with the support of the J. Craig Venter Institute and other national experts in microbiome research. More information about the exhibition can be found at http://omsi.edu/exhibitions/zoo-in-you/.

### *Zoo in You* Project Goals

1. Educate museum visitors and program participants about what the human microbiome is, and engage their curiosity and creativity about their own unique and personal microbiomes.
2. To build awareness of current research on the human microbiome and the impacts of the microbiome on our personal health and disease.

### Design and Methods

A summative evaluation was conducted to gather information about the extent to which the project was achieving its goals of engaging the public around the human microbiome, microbes, and the research being done in this area. A multiple mixed methods approach was used to gather information about the project, including: 1) a general visitor study with visitors to *Zoo in You* at OMSI in Portland, Oregon and ScienceWorks in Ashland, Oregon (n=120); 2) a Family Science Night study focused on Spanish-speaking visitors (n=43); and 3) a Science Café study during an evening program (n=142). Utilizing different approaches and methods with different audiences allowed for a wider understanding of how the *Zoo in You* exhibition was reaching audiences at different sites and in different circumstances.

### Main Findings

**Engagement with the exhibition** – Time spent in *Zoo in You* varied a bit by institution. Median time spent at OMSI was 7 minutes 55 seconds, while it was slightly longer at ScienceWorks at 15 minutes 0 seconds. Visitors at ScienceWorks on average stopped at two more exhibit elements (8.3) compared to OMSI visitors (6.0). It is likely that the big size difference in the institutions and possibly location of the exhibition played a part: there were many more exhibitions to visit at OMSI compared to ScienceWorks, and *Zoo in You* was more set off in its own space at ScienceWorks. There were, however, quite a few similarities in how visitors engaged the exhibition. Of the top five exhibit elements

engaged in, four were the same across both locations: Hand Washing, Marble Maze, Weather Report, and Under the Lens. When asked which exhibit elements worked best for the whole group, which was intergenerational, all of the top five specific exhibit elements mentioned were the same for both locations: Hand Washing, DNA Puzzle, Marble Maze, Weather Report, and How Tiny. This shows that the intention of designing exhibitions that could appeal to varying audiences in different locations has some consistency in what groups find appealing and engaging.

**Awareness and Understanding** – When asked what they learned from the exhibition, visitors were most likely to reference a specific exhibit element or exhibition concept, or the size and number of microbes. Some visitors did talk about the fact that microbes/bacteria/viruses could be both good and bad for humans, whereas prior to visiting the exhibition they had only thought they could be bad. Another item inquired about the main idea of the exhibition, and the most common responses had to do with learning about microbes in general, showing how the human body worked, microbes can be good and bad, and how to stay healthy. In terms of mentioning specific exhibition areas that communicated the main messages, visitors at both institutions mentioned the Hand Washing and How Tiny exhibit elements as good communication tools of the main ideas of the exhibition. Visitors said the Under the Lens, Weather Report, and MVP Puzzle also did a good job communicating the main messages.

The Science Café event was held independent of the exhibition and was more of a presentation; however, it also had success in engaging people around the content. More than one quarter of participants referenced specific information from the presentation when asked what they learned during the Science Café event, and almost one fifth of participants said they learned about the human microbiome in general.

**The Term "Human Microbiome"** – The project team was interested in the extent to which visitors to the exhibition were aware of the specific term "human microbiome" and what it meant relative to the exhibit elements and content. However, many of the general visitors at both locations said they did not specifically remember seeing the term in the exhibition; those who did say they saw it often had a tough time describing it accurately and in detail. However, as mentioned above many of the visitors gained an understanding of the main messages of the exhibition: how the human body works, what microbes are, and that microbes can be good and bad. So any lack of noticing or understanding this specific term did not interfere with the overall exhibition goals.

**Bilingual Nature of the Exhibition** – For visitors to *Zoo in You* recruited during regular visiting hours, there were not very many who spoke Spanish on a regular basis. As such, they did not need to engage with the bilingual Spanish/English text. Still, the overwhelming majority of visitors to *Zoo in You* said having a bilingual exhibition enhanced or made no difference to their experience, which is important given that some institutions have expressed concern that doubling the text would overwhelm non-Spanish speakers.

For the Spanish-speaking groups visiting during the Family Science Night event, the bilingual text had a large positive impact on their visit to *Zoo in You*, mainly because many members of the group needed Spanish to fully experience the exhibition. This allowed them to engage in their native tongue, know what to do at the various exhibit elements, and more fully understand the content and learn more. Almost three quarters said the museum having the exhibition in Spanish changed how they felt about OMSI. More than three quarters said they were likely to return to OMSI at a different time.

## Discussion

This section is a discussion of the main findings, their significance, and some discussion of how they relate to findings elsewhere in the field. This section seeks to add context to the findings themselves, as well as how one may think about the findings as they relate to each other and the field in general.

In terms of **engagement with the exhibition** the most obvious difference was that stay time was different at the two institutions with visitors spending more time in the exhibition at ScienceWorks, the smaller institution. This is a common trend in the museum world, where visitors' stay time is driven by trying to maximize their time by splitting a visit up according to what there is to see and do. This approach of taking into account how much there is to do can drive how long people spend in a particular area, since if they want to "see it all" then they split up the time between the various exhibitions. The location of the exhibition may have also had something to do with stay time: at OMSI, *Zoo in You* was on the second floor and in a larger room with more than one exhibition alongside it (i.e., the Nanotech exhibition on one side and the Prenatal Display on another). At ScienceWorks it was in a separate room at the end of the museum, where it was in more of a "pocket" area, where you walked through one exhibition, then entered a room that only had *Zoo in You* in it. Therefore, there was less flow in and out of the exhibition at ScienceWorks than at OMSI.

With the longer stay time it was also not surprising that people engaged in a couple more exhibit elements at ScienceWorks compared to OMSI. However, we cannot know whether people in that location went to more exhibits elements because they spent more time in the exhibition, whether they spent more time because they went to more exhibits elements, or whether they saw more elements because there were fewer total elements in the museum. Oftentimes, we assume that a longer stay time is better, and it is certainly true that you can do more if you stay longer, but that does not necessarily mean that you will experience more exhibit elements. There seems to be a zero sum factor in terms of the amount of time people will stay; if you add more components then visitors tend to be more selective about what they visit, they tend not to add to their total visit time simply because there is more to see. The average total visit time for a museum is around 2 to 3 hours. There are exceptions, of course, but Rounds (1994)

talked about the foraging behavior of visitors (rather than seeing everything) being a very effective approach because people spend time engaging in components they find inherently interesting, and can focus on fewer experiences in more depth.

Looking at the **types of elements that were most engaging**, the fact that many of the same exhibit elements were the most popular at both sites suggests that there is an inherent pattern in the kinds of elements visitors find engaging in *Zoo in You*. Many of the elements had components that were both similar and unique at the same time. For example, the Hand Washing element was about something we hopefully do every day, yet presented the unique content about the amount of bacteria that remain in a visual manner that we don't normally see. This exhibit component also seemed to be popular for parents as a means of reinforcing something they are frequently asking their child(ren) to do. A popular exhibit like the Marble Maze had a hands-on component of a pinball machine game that many are familiar with, but with content was unique. The kinds of exhibits that were popular tended to be ones that were hands-on, and either offered familiar experiences or content (marbles, washing hands, puzzles) or offered a unique experience ("doing" the weather, seeing relative size by moving a lever). Exhibit designers and developers have been focused on finding a balance between a prior knowledge and new content for quite some time, with the goal of making it a worthwhile experience.

While 7 of the 14 exhibit elements at OMSI had a stay time of a minute or longer, this was true for 9 of the 14 elements at ScienceWorks. A stay time of a minute would allow for a decent amount to engage with an experience. For *Zoo in You* it seems that if people stop they are deciding to spend a relatively decent amount of time at that exhibit element; they are not just browsing but engaging. Given time constraints, we were not able to conduct tracking studies during the Family Science Night Study, but it would also be interesting to see whether there were similar patterns of behaviors for groups that are using the available bilingual interpretation.

As mentioned in the findings sections, there is ample evidence that **visitors were learning during the experience**. Visitors seemed to get the idea that we have microbes in our bodies, they are small, there are a lot of them, and there is an interaction between our body and these microbes that can be both positive and negative. The approach of using hands-on experiences as a way of engaging did work, especially when visitors made some kind of connection with or expanded upon what they already knew. Fewer general visitors said they saw the term "human microbiome" in the exhibition at OMSI, compared to visitors to ScienceWorks or participants during the OMSI Family Science Night. Even while people said they saw the term, when individuals who did see it were asked what stood out for them about the term they had a more difficult time describing what it was. This does not mean they weren't able to recall specific facts within the topic, they just had a harder time discussing what the human microbiome was defined as.

When talking about what they specifically learned, participants tended to either stay very general in their statements or talk about specific exhibit elements. For example, when asked about what the main idea was participants most frequently mentioned microbes in general, how the body works, and being healthy (although, to be fair, the item did ask for the main idea and not specifics). In fact, the being healthy message was one that seemed to come through, not only because of the content but also because health is something everyone can relate to and is concerned about. One related idea that seemed to get through was that microbes/viruses/bacteria were not only bad for you but could have a positive effect. While some people had more extensive knowledge of the topic because of occupations or interests, this was surprising to many individuals since we have been taught that germs are bad. Additionally, the message about the importance of microbes seemed to come through, though the uniqueness and constant state of change of one's own microbiome (one of the main ideas) was not mentioned as frequently by visitors. As mentioned, there were many ideas that people could recall from specific content so visitors do seem to be getting both general information about the human microbiome across the exhibition, as well as specific pieces they picked up at individual exhibit components. The exhibit does seem to have achieved the right balance in providing engaging experiences around interesting or relevant content that was memorable and informative for visitors.

In general, the **Spanish-speaking visitors found the bilingual interpretation to be very helpful**, while almost as importantly the non-Spanish speaking visitors said that it did not detract from their experience in *Zoo in You*. When asked why it enhanced their visit, people talked about how they understand or learn better in their own language, someone in their group doesn't speak English, or because their first language is Spanish. The fact that having the content in Spanish changed how the large majority of Spanish-speaking visitors felt about OMSI is not surprising, given that it meant they could engage in the content with more ease. While this study did not delve deeply into the reasons why having bilingual interpretation would enhance the experience of Spanish-speaking groups, an NSF research study has confirmed that there are many positive affordances for bilingual groups when you provide content in both Spanish and English. See http://informalscience.org/projects/ic-000-000-001-774/Bilingual_Exhibits_Research_Initiative_(BERI); Yalowitz, Garibay, Renner, & Plaza (2015); Renner, Garibay, Yalowitz, & Plaza (2015). Even though access to content is very important, the study showed that accessing content was less about simply understanding and was more often a way to facilitate the experience for others or not to "hold back" the rest of the group. Including Spanish also provided a way to connect to their culture through language, or practice the language they were less comfortable with in a safe environment. This last point is interesting, in that second or third generation Latinos/Hispanics are often English only or English dominant, so monolingual Spanish-speaking parents see having interpretation in both languages as a way for their children to practice or learn Spanish. In the NSF study, there was also evidence that it made them feel more comfortable, enjoy the visit more, and feel more valued by the

institution. The study was also highlighted in an issue of the journal Museums and Social Issues (Volume 10, Issue 1) that looked at redefining multilingualism in museums and includes other related articles: http://www.maneyonline.com/toc/msi/10/1.

This point that non-Spanish speakers were either not affected by or positively affected by the inclusion of Spanish interpretation is an important one. When the topic of bilingual text comes up in the museum field there is usually a comment that non-Spanish speakers will be visually confused or overwhelmed by the amount of text if it were doubled (or slightly more than doubled, given that Spanish tends to take slightly more characters than its English counterpart). In fact, the overwhelming majority of non-Spanish speakers in this study said it either made no difference, meaning they can just ignore it, or that it actually enhanced their experience. A little more than 1 out of 5 non-regular Spanish speakers said it enhanced their experience, either because they had some knowledge of Spanish already or that it would be beneficial for those who did speak Spanish. The very few people who said it detracted from their experience commented on the fact that some of the subtitles on screens showed up only in Spanish, and they were not sure if English were available or how to switch it. These comments were less about the presence of Spanish in the exhibit, and more about how it was included. These findings echo those previously found in some unpublished studies; in fact, there is pretty much only anecdotal evidence about the negative impact on the visitor experience when text is presented in multiple languages, and these tend to be a very small number of comments from a few individuals. Much of how visitors will respond to multilingual labels depends on how they are created and designed, and the Nanotechnology NSF-funded project created a bilingual design guide that is very helpful: see the main NISE Network site at http://www.nisetnet.org (the direct link to the guide is in References section of this report).

Overall, the *Zoo in You* exhibition did a good job of engaging visitors in the main topics about the human microbiome, with visitors building on what they already knew and adding to their knowledge. The mix of exhibit approaches was effective, with visitors realizing multiple main messages as well as specific information in particular exhibit components. The bilingual approach did not negatively impact the experience for non-Spanish speakers and provided many affordances for bilingual Spanish-speaking groups.

# INTRODUCTION AND PROJECT BACKGROUND

## Overview

The National Institutes of Health (NIH) awarded OMSI funding for *Zoo in You: Exploring the Human Microbiome* through a Science Education Partnership Award (SEPA) grant (1 R25 RR032210-01). OMSI partnered with human microbiome researchers at the J. Craig Venter Institute (JCVI) to develop a 2,000 sq. ft. bilingual (English/Spanish) traveling exhibition, as well as public programming and a website exploring current research on the human microbiome and the impact of our resident microorganisms on our health. The exhibition advisory team included additional experts on the topics of microbes, public health, and informal science education techniques. More information about the project, including descriptions and photographs of the 14 exhibit components that make up the traveling exhibition, can be found at http://omsi.edu/exhibitions/zoo-in-you/ . Renderings and descriptions of exhibit components can also been seen in Appendix A.

**CHALLENGES**

- Translate unfamiliar cutting-edge science into stories and experiences that are engaging for families and school groups.
- Create bilingual, family-friendly exhibits that playfully explore our invisible inhabitants and foster positive appreciation of our inner microbial life.

**SOLUTION**

*Research & Development*

As microbiome research is a technologically complex and rapidly advancing field, OMSI partnered with the J. Craig Venter Institute, a national leader in research on the human microbiome. OMSI's exhibit developers worked directly with research scientists to craft accurate and relevant stories and experiences for visitors.

*Bilingual*

*Zoo in You: The Human Microbiome* was co-developed in Spanish and English by native speakers. Since two languages automatically double the amount of text, the project team used innovative strategies to communicate information visually and reduce the amount of text.

*Design*

OMSI designed this exhibition to be playful, colorful, and attractive. The human microbiome can be difficult to fathom—it is a pervasive and essential part of us, yet it is invisible and difficult to detect. Designers created interactive exhibit elements that are easy to use with bold, eye-catching graphics to create an appealing experience for a wide audience range.

## Main Objectives

***Zoo in You* Project Goals**

1. Educate museum visitors and program participants about what the human microbiome is, and engage their curiosity and creativity about their own unique and personal microbiomes.
2. Build awareness of current research on the human microbiome and the impacts of the microbiome on our personal health and disease.

**Evaluation Questions**

The following evaluation questions are based on conversations with OMSI about the summative evaluation.

1. To what extent and in what ways are visitors engaged and interested in the human microbiome and current research about it?

2. Which characteristics or parts of the experience lead to the most engagement and interest in the topics and deliverables?

3. To what extent and in what ways do the experiences influence visitors' awareness and understanding of their own human microbiome?

4. Do visitor experiences result in increased understanding of the main topics about microbiomes: a) why your microbiome is important and unique, and b) how your daily habits and lifestyle choices impact your human microbiome?

5. How are bilingual (Spanish/English) signs/copy being used by visitors? How does it change the experience for visitors, including their understanding, interactions and connection with OMSI?

### Audience Impacts

**Target Audiences**
The target audiences for this study included the following:

- **General visitor groups** (at OMSI and ScienceWorks) with children in grades 4-12
- **Spanish-speaking visitor groups** (at OMSI) with children in grades 4-12, attending the *Zoo in You* exhibition as part of general visitor groups, and a Family Science Night
- **Adults (18+) attending a Science Café** at OMSI

The goal of the study was to gain a representative sample of visitors within the groups above at OMSI and ScienceWorks in order to understand visitor needs and perspectives about *Zoo in You*.

## SUMMATIVE EVALUATION APPROACH AND DESIGN

To answer the evaluation questions above, the Audience Viewpoints Consulting (AVC) team employed three main methods/studies:

1) A General Visitor study at OMSI and ScienceWorks
2) A Family Science Night study at OMSI, focused on Spanish-speaking visitors
3) A Science Café study at OMSI, during the program

The reason for using multiple methods is to help to gain a number of perspectives from the different audiences listed above. The methods and sampling plan presented in the tables below attempt to answer the evaluation questions and help determine to what extent *Zoo in You,* and its deliverables, meet the stated goals and objectives for the project.

All materials were available in English and Spanish, with all study participants selecting which language they would prefer for participation. Bilingual data collectors interacted with visitors and conducted interviews in both English and Spanish. Data were collected at two sites, OMSI (July 2015) and ScienceWorks (October 2015).

# METHODS

## METHOD 1: General Visitor Study

| Method(s) | Sample Size (n=120 total) | Purpose |
|---|---|---|
| **Paired cued observations and interviews at OMSI and ScienceWorks** | n= 90 observations and interviews at OMSI<br><br>n= 30 observations and interviews at ScienceWorks | Examine visitor awareness, engagement, and interest in topics about the human microbiome. Compare the *Zoo in You* experience at OMSI and ScienceWorks |

The AVC team decided to cue visitor groups (i.e., asking them before they enter if they agree to be observed and then interviewed after they visit the exhibition) to ensure a more efficient data collection period. It would have been more difficult to intercept visitors after observing them and possibly lose the interview portion if they decided not to participate in the study. Additionally, since *Zoo in You* has an open floor plan, where a visitor group can leave the space and come back to it at multiple locations, it was important to let groups know which exhibit elements were included in *Zoo in You* so visitors would remain in that space during the study period.

To examine the exhibition components with general visitors at OMSI and ScienceWorks (in Ashland, Oregon), visitors were recruited at the entrance of the exhibition and asked to participate in the study. Those who agreed were first observed in the exhibition, and then interviewed about their visit afterwards. The target audience consisted of general visitor groups with children in grades 4-12, including Spanish-speaking groups (materials were available in English and Spanish). At the end of the interview, visitor groups were asked to complete a short survey consisting primarily of demographic questions.

Evaluation instruments use in OMSI and ScienceWorks were essentially the same; the name of institutions and the maps used for timing and tracking are the exceptions (see Appendices B and C for the instruments). Since ScienceWorks represents the type of museum – in size, and visitor attendance – that might rent the *Zoo in You* traveling exhibition, the hope was that information gathered at ScienceWorks would help paint a picture of the visitor experience, including time attending the exhibition and audience demographics, at another science center. This would be helpful when talking to other institutions considering taking *Zoo in You*, as ScienceWorks may be more typical of the type of institution to host the exhibition.

## METHOD 2: Family Science Night Study

| Method(s) | Sample Size | Purpose |
|---|---|---|
| **Interviews** | n= 43 family groups Spanish-speaking | Reach the target audience of Spanish-speaking families. Gather reaction to bilingual nature of exhibition, interactions and connection with OMSI. |

To reach the target audience of Latino/Hispanic/Spanish-speaking family groups, data collection occurred during a Family Science Night, a special event held at OMSI on July 20, 2015. Two halls (the Earth Science and Life Science halls) were cordoned off for the event. The *Zoo in You* exhibition was located in the Life Science hall. Bilingual data collectors were employed, and each data collector conducted interviews in English and/or Spanish with Spanish-speaking visitors (visitors chose the language they preferred). Since the event lasted for two hours, the AVC team used three data collectors to conduct short interviews lasting between 8 to 10 minutes each in order to reach the target sample size. See Appendix D for the instrument.

## METHOD 3: Science Café Study

| Method(s) | Sample Size | Purpose |
|---|---|---|
| **Surveys** | n= 142 adults | Examine visitor awareness, engagement, and interest in topics about the human microbiome. |

Surveys were used to evaluate the Science Café held on August 18, 2015 at the Empirical Theatre, at OMSI. It was originally expected that this portion of the evaluation would include only adults (18 years and older), however there was a small percentage of participants who attended the Science Café event who were under the age of 18 years old. OMSI staff distributed surveys for participants to complete. Given the duration of the event and the need to reach many participants at once, participants were given pen-and-paper surveys. A short survey was the most successful way to collect a larger number of surveys at the event. The original goal was to collect 50 to 75 surveys, however the number of participants in attendance exceeded the estimated attendance number. The evaluation instrument included items focused on the Science Café, its content and delivery, and had some questions from the General Visitor Study. This included rating items, as well as closed and open-ended questions. See Appendix E for the instrument.

## FINDINGS: *General Visitor Study*

Note: In the findings section not all of the sample sizes for the tables will match the total number of participants in the study. Typically, this is because some participants did not answer a question or fill out part of the demographic survey. When not everyone answered a question the percentage is divided by the number of respondents and not the number of participants.

### Sample- OMSI

Data collection for the general visitor study at OMSI was conducted over five days, from July 21st, 2015 through July 25th, 2015. Visitors were intercepted as they entered the *Zoo in You* exhibition and asked to participate in the study. Any individual who declined to participate in the study was not observed and was not asked to participate in an interview at the end of their visit. There were approximately 15 refusals to participate in the study.

Data collectors encouraged visitors to explore the exhibition in the way they normally would, then return to the data collector at the end of their time in the exhibition. During the visit, data collectors observed and tracked the main visitor and their group, noting at which exhibit elements they stopped, for how long, and whether any member of the group participated in a hands-on activity within the exhibition. At the end of the visit, data collectors conducted a short interview with the main visitor, including any other members of the group who chose to participate in the interview.

More than two thirds of participants (71%) in the general visitor study at OMSI were female, compared to just over a quarter (29%) male (see **Table 1**). Most general visitors at OMSI ranged between 31 and 50 years old, with the largest majority (33%) between 31 and 40 years old. Along with the 90 individuals who completed an interview, 281 individuals toured the exhibition in the groups with the survey participants. See **Table 1** for a breakdown of the ages of other general visitors to OMSI. Most of the other individuals visiting OMSI (69%) were under the age of 18 years old. Half of general visitors to OMSI lived in Oregon. Almost a third of visitors (32%) lived in the western United States, while a smaller percentage of visitors (14%) lived in other parts of the United States or were international visitors.

More than three quarters of the general visitor participants at OMSI identified as White. Participants were invited to write a better description of their racial identity in the "Other" category. Examples of those descriptions written in the "Other" category are: American Indian and White, Asian and White, Black and Asian, Hispanic and Mexican. A smaller percentage of visitors described themselves as Asian (6%), American Indian/Alaska Native (1%), Native Hawaiian/Pacific Islander (1%) and African American/Black (1%). Most general visitors to OMSI (89%) did not identify as Latino/Hispanic/Spanish in origin.

**Table 1: Demographics for General Public Visitors at OMSI**

| Characteristic | Number of participants (n=90) | Percentage |
|---|---|---|
| ***Gender*** | ***n=84*** | ***Percentage*** |
| Female | 60 | 71% |
| Male | 24 | 29% |
| ***Age Category*** | ***n=90*** | ***Percentage*** |
| 6 to 11 | 2 | 2% |
| 12 to 18 | 5 | 6% |
| 19 to 25 | 2 | 2% |
| 26 to 30 | 7 | 8% |
| 31 to 40 | 30 | 33% |
| 41 to 50 | 24 | 27% |
| 51 to 60 | 6 | 7% |
| 61 and above | 14 | 16% |
| ***Age of Other Group Members*** | ***90 Groups*** | ***Percentage*** |
| 0 to 5 | 36 | 13% |
| 6 to 11 | 115 | 41% |
| 12 to 18 | 43 | 15% |
| 19 to 25 | 8 | 3% |
| 26 to 30 | 9 | 3% |
| 31 to 40 | 30 | 11% |
| 41 to 50 | 28 | 10% |
| 51 to 60 | 5 | 2% |
| 61 and above | 7 | 2% |
| ***Location of Visitors*** | ***n=84*** | ***Percentage*** |
| Live in Oregon | 45 | 54% |
| Live in western United States | 27 | 32% |
| Live outside of western United States | 12 | 14% |
| ***Race of Participants*** | ***n=85*** | ***Percentage*** |
| Caucasian or White | 67 | 79% |
| Other | 10 | 12% |
| Asian | 5 | 6% |
| American Indian or Alaska Native | 1 | 1% |
| Native Hawaiian or Pacific islander | 1 | 1% |
| African American or Black | 1 | 1% |
| ***Latino/Hispanic/Spanish Origin of Participants*** | ***n=84*** | ***Percentage*** |
| Non- Latino/Hispanic/Spanish origin | 75 | 89% |
| Latino/Hispanic/Spanish origin | 9 | 11% |

**Table 1: Demographics for General Public Visitors at OMSI, continued**

| ***Language Spoken at Home by Participants*** | ***Number of participants (n=84)*** | ***Percentage*** |
|---|---|---|
| English | 70 | 83% |
| Combination of English and another language other than Spanish | 6 | 7% |
| English and Spanish | 5 | 6% |
| Spanish | 1 | 1% |
| Mandarin | 1 | 1% |
| Cantonese | 1 | 1% |
| ***Previous OMSI Attendance*** | ***n=85*** | ***Percentage*** |
| Have visited before | 50 | 59% |
| First visit to OMSI | 35 | 41% |
| ***OMSI Membership of Participants*** | ***n=85*** | ***Percentage*** |
| Non-member | 59 | 69% |
| Member | 26 | 31% |

More than three quarters of general visitors to OMSI (83%) spoke only English at home. A small percentage of OMSI visitors (6%) spoke both English and Spanish at home, and another 7% of visitors spoke a combination of English and another language at home. Combinations of English and another language spoken at home include Thai, Mandarin, Nahuatl, French, Russian and Korean.

Over half of the general visitors to OMSI (59%) had visited OMSI before. Less than a third (31%) of general visitors to OMSI were members, while two thirds of visitors were non-members. The majority of OMSI general visitors (74%) said they were likely to visit OMSI again in the future (see **Table 2**).

**Table 2: Likelihood of Returning, Participants in General Visitor Study at OMSI**

| Rating | (Not at all) **1** | **2** | **3** | **4** | **5** | **6** | (Very likely) **7** |
|---|---|---|---|---|---|---|---|
| Number of responses (n=83) | 1 | 4 | 1 | 6 | 10 | 14 | 47 |
| Percentage of Participants | 1% | 5% | 1% | 7% | 12% | 17% | 57% |

Note: Scale was from 1 (Not at all likely) to 7 (Very likely)

## Sample- ScienceWorks

Data collection for the general visitor study at ScienceWorks was conducted over three days, from October 23rd, 2015 through October 25th, 2015. Visitors were intercepted as they entered the *Zoo in You* exhibition and asked to participate in the study. Any individual who declined to participate in the study was not observed and was not asked to participate in an interview at the end of their visit. There were approximately 4 refusals to participate in the study, all of which were due to groups attending birthday parties at ScienceWorks on one of the days of data collection.

Data collectors encouraged visitors to explore the exhibition however they normally would, then return to the data collector at the end of their time in the exhibition. During the visit, data collectors observed and tracked the main visitor and their group, noting at which exhibit elements they stopped, for how long, and whether any member of the group participated in a hand-on activity within the exhibition. At the end of the visit, data collectors conducted a short interview with the main visitor, including any other members of the group who chose to participate in the interview.

More than two thirds of participants (67%) in the general visitor study at ScienceWorks were female (see **Table 3**). Most general visitors at ScienceWorks were adults above the age of 31 years old, with the largest majority (37%) between 31 and 40 years old. Along with the 30 individuals who completed an interview, 115 individuals attended the visit in the groups with the survey participants. See **Table 3** for a breakdown of the ages of other general visitors to ScienceWorks. Most of the other individuals visiting ScienceWorks (76%) were under the age of 18 years old. More than three quarters of general visitors to ScienceWorks (77%) lived in Oregon. The other general visitors interviewed at ScienceWorks (23%) lived in the western United States.

The majority of general visitors to ScienceWorks (76%) identified as White. A smaller percentage of visitors identified as Asian (3%), African American/Black (3%), and American Indian/Alaska Native (3%). More than 10% of ScienceWorks visitors chose the "Other" category. Participants were invited to write a better description of their racial identity in the "Other" category. Examples of those descriptions written in the "Other" category are: American Indian and White, Asian and White. Only 10% of general visitors to ScienceWorks identified as Latino/Hispanic/Spanish in origin. Almost all visitors to ScienceWorks (97%) said they spoke only English at home, with just 3% of visitors speaking a combination of English and Urdu at home. More than three quarters of the general visitors to ScienceWorks (77%) had visited ScienceWorks before. General visitors to ScienceWorks were split 50/50 in terms of members and non-members, which is a relatively high number of visiting members.

**Table 3: Demographics for General Public Visitors at ScienceWorks**

| *Characteristic* | *Number of participants (n=30)* | *Percentage* |
|---|---|---|
| ***Gender*** | ***n=30*** | ***Percentage*** |
| Female | 20 | 67% |
| Male | 10 | 33% |
| ***Age Category*** | ***n=30*** | ***Percentage*** |
| 6 to 11 | 1 | 3% |
| 12 to 18 | 4 | 13% |
| 19 to 25 | 1 | 3% |
| 26 to 30 | 2 | 7% |
| 31 to 40 | 11 | 37% |
| 41 to 50 | 3 | 10% |
| 51 to 60 | 3 | 10% |
| 61 and above | 5 | 17% |
| ***Age of Other* Group *Members*** | ***30 Groups*** | ***Percentage*** |
| 0 to 5 | 18 | 16% |
| 6 to 11 | 58 | 50% |
| 12 to 18 | 16 | 10% |
| 19 to 25 | 1 | 1% |
| 26 to 30 | 3 | 3% |
| 31 to 40 | 5 | 4% |
| 41 to 50 | 8 | 7% |
| 51 to 60 | 5 | 4% |
| 61 and above | 5 | 4% |
| ***Location of Visitors*** | ***n=30*** | ***Percentage*** |
| Live in Oregon | 23 | 77% |
| Live in western United States | 7 | 23% |
| Live outside of western United States | 0 | 0% |
| ***Race of Participants*** | ***n=29*** | ***Percentage*** |
| Caucasian or White | 22 | 76% |
| Other | 4 | 14% |
| Asian | 1 | 3% |
| Native Hawaiian or Pacific islander | 1 | 3% |
| African American or Black | 1 | 3% |
| American Indian or Alaska Native | 0 | 0% |
| ***Latino/Hispanic/Spanish Origin of Participants*** | ***n=26*** | ***Percentage*** |
| Non- Latino/Hispanic/Spanish origin | 23 | 89% |
| Latino/Hispanic/Spanish origin | 3 | 11% |

**Table 3: Demographics for General Public Visitors at ScienceWorks, continued**

| ***Language Spoken at Home by Participants*** | ***Number of participants (n=29)*** | ***Percentage*** |
|---|---|---|
| English | 28 | 97% |
| English and Urdu | 1 | 3% |
| Spanish | 0 | 0% |
| ***Previous ScienceWorks Attendance*** | ***n=30*** | ***Percentage*** |
| Have visited before | 23 | 77% |
| First visit to ScienceWorks | 7 | 23% |
| ***ScienceWorks Membership of Participants*** | ***n=30*** | ***Percentage*** |
| Non-member | 15 | 50% |
| Member | 15 | 50% |

The majority of ScienceWorks general visitors (87%) said they were likely to visit ScienceWorks again in the future (see **Table 4**).

**Table 4: Likelihood of Returning, Participants in General Visitor Study at ScienceWorks**

| Rating | (Not at all likely) **1** | **2** | **3** | **4** | **5** | **6** | (Very likely) **7** |
|---|---|---|---|---|---|---|---|
| n=30 | 0 | 1 | 2 | 1 | 0 | 2 | 24 |
| Percentage of Participants | 0% | 3% | 7% | 3% | 0% | 7% | 80% |

Note: Scale was from 1 (Not at all likely) to 7 (Very likely)

*How Tiny* exhibit element

## Analysis- OMSI

### Timing and Tracking

Of individuals tracked in *Zoo in You* at OMSI, times ranged from 40 seconds to 25 minutes and 38 seconds. The median time was 7 minutes 55 seconds, meaning that the average group spent just a little under 8 minutes in the exhibition; median is used as it is the middle number, and is not skewed by larger or smaller numbers disproportionately (as the mean is).

In terms of the number of elements stopped at in OMSI (out of 14 total exhibit components) was 6.0; the average group stopped at less than half of the exhibit components (43%). See **Table 5** for a complete list of the number of stops made by visitors during their visit to *Zoo in You* at OMSI.

**Table 5: Total Number of Exhibit Elements Stopped At (out of 14), at OMSI**

| Number of elements stopped at | Number of participants (n=89) | Percentage |
|---|---|---|
| 0 | 0 | 0% |
| 1 | 2 | 2% |
| 2 | 3 | 3% |
| 3 | 11 | 12% |
| 4 | 12 | 14% |
| 5 | 10 | 11% |
| 6 | 14 | 16% |
| 7 | 13 | 14% |
| 8 | 8 | 9% |
| 9 | 9 | 10% |
| 10 | 6 | 7% |
| 11 | 1 | 1% |
| 12 | 0 | 0% |
| 13 | 0 | 0% |
| 14 | 0 | 0% |

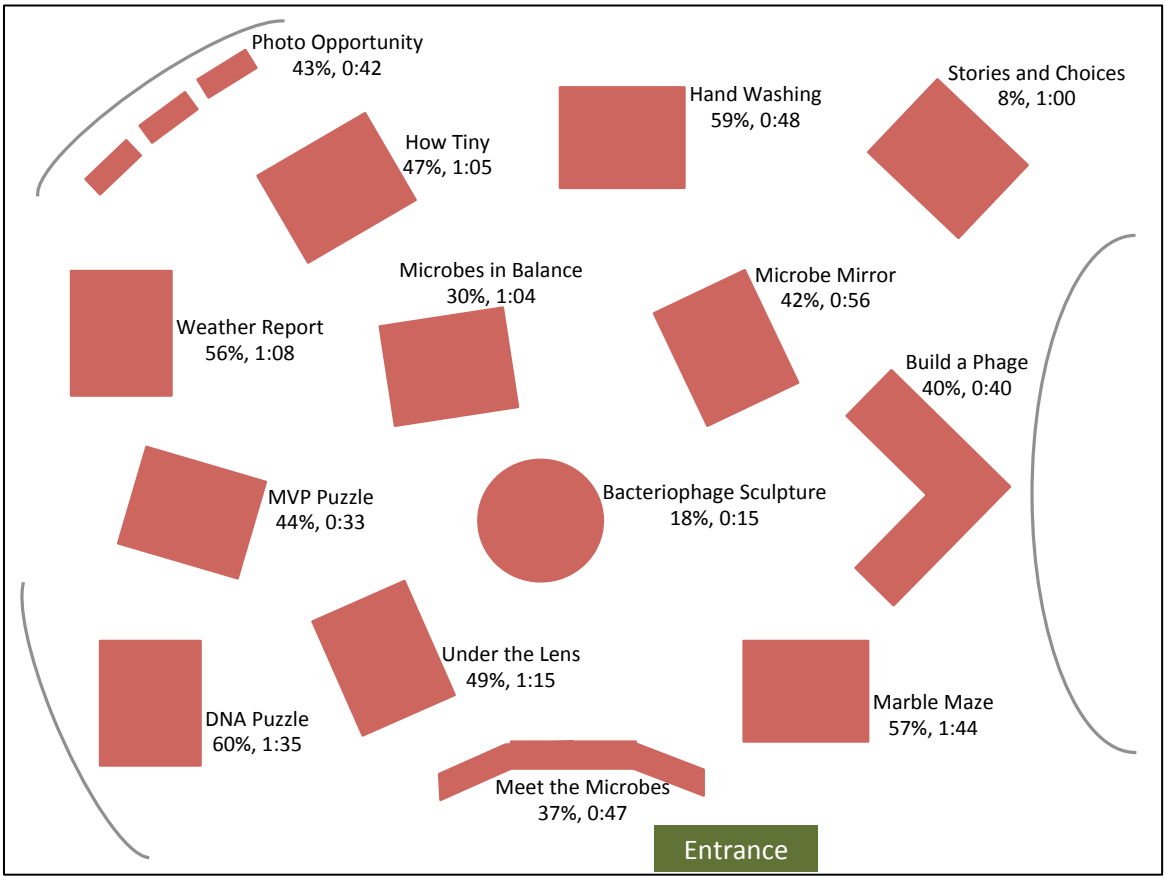
Of individuals tracked in the *Zoo in You* exhibition at OMSI the most attractive exhibit elements, by the percentage who stopped to engage them, were the DNA Puzzle (60%), the Hand Washing station (59%), the Marble Maze (57%), and Weather Report (56%). Six of the exhibit elements had stopping percentages in the forty percent range. In fact, the median percent for an exhibit element was 44%, meaning that on average an exhibit element was likely to attract around two-fifths of the groups visiting *Zoo in You*.

In looking at the median time for those who engaged with specific exhibit elements, the highest stay times were for the Marble Maze (1:44), DNA Puzzle (1:35), and Under the Lens (1:15). There were an additional number of components that had a stay time of one minute or just over: Weather Report, How Tiny, Microbes in Balance, and Stories and Choices. The rest had a stay time of under one minute (see **Table 6** and **Figure 1**). See Appendix B for rendered drawings of the exhibit components on the floor at OMSI.

**Table 6: Percentage Engaging and Time at Exhibit Components, at OMSI**

| Exhibit Elements | Number of participants (n=90) | Percentage Engaging | Median Time (those who engaged) |
|---|---|---|---|
| DNA Puzzle | 54 | 60% | 1 min. 35 sec. |
| Hand Washing | 53 | 59% | 48 sec. |
| Marble Maze | 51 | 57% | 1 min. 44 sec. |
| Weather Report | 50 | 56% | 1 min. 8 sec. |
| Under the Lens | 44 | 49% | 1 min. 15 sec. |
| How Tiny | 42 | 47% | 1 min. 5 sec. |
| MVP Puzzle | 40 | 44% | 33 sec. |
| Photo Opportunity | 39 | 43% | 42 sec. |
| Microbe Mirror | 38 | 42% | 56 sec. |
| Build a Phage | 36 | 40% | 40 sec. |
| Meet the Microbes | 33 | 37% | 47 sec. |
| Microbes in Balance | 27 | 30% | 1 min. 4 sec. |
| Bacteriophage Sculpture | 16 | 18% | 15 sec. |
| Stories and Choices | 7 | 8% | 1 min. 0 sec. |

**Figure 1: Map of Engagement and Stay Times of Exhibit Components at OMSI (n=90)**




## Interview

Note: For open-ended responses, direct quotes are provided in italics.

General visitors were asked to complete this sentence about their visit to the *Zoo in You* exhibition: "I never realized that…" Visitors to OMSI most often (17%) referenced learning something from a particular part of the *Zoo in You* exhibition (see **Table 7**). Some visitors (16%) said they already knew about the human microbiome. General visitors also reported learning about the small size of microbes (14%) and the number of microbes humans have on their bodies and in their bodies (14%). The same percentage of visitors (14%) said they did not read much or did not know how to answer the question. A few visitors (8%) learned about what a microbe is, and a few visitors (3%) learned that microbes could be good for humans. And 8% of visitors gave responses that did not fit into any of these categories.

**Table 7: What General Visitors Learned at *Zoo in You* at OMSI**

| Response | Number of participants (n=82) | Percentage |
|---|---|---|
| Reference of specific part of exhibition | 15 | 17% |
| I already knew about this topic | 14 | 16% |
| Microbes were small/size | 13 | 14% |
| We have so many microbes on us and in us | 13 | 14% |
| I didn't read much/ I don't know | 13 | 14% |
| What a microbe is | 7 | 8% |
| Microbes can be good for humans | 3 | 3% |
| Everything is new/ I didn't know any of this | 2 | 2% |
| Miscellaneous | 8 | 8% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Visitors to OMSI most often (17%) referenced learning something from a **particular part of the *Zoo in You* exhibition.**

> *You had to wash your hands for so long to get the germs off.*
>
> *That microbes are in pills.*
>
> *That eating Archaea makes you fart.*

Some visitors (16%) said they **already knew about the human microbiome**.

> *Went through anatomy class. Already knew a lot.*
>
> *The exhibit is new to me, but I'm a nurse so not the content.*
>
> *I don't know. My husband's a high school science teacher and I am in the field too.*

Some general visitors (14%) also reported learning about the **small size of microbes**.

> *Microbes are so small. And there are so many of them.*
>
> *Learning could be so interactive. How tiny the microbes are. That's crazy.*
>
> *Other bacteria can actually be that small.*

Some general visitors (14%) found out about the **number of microbes humans have on their bodies** and in their bodies.

> *There's so many germs on your body.*
>
> *That we had fungus all over us, naturally.*
>
> *The number of microbes in our body.*

The same percentage of visitors (14%) said they **didn't read much or didn't know how to answer the question.**

> *Didn't read much.*
>
> *I'm with the kids and so I'm not really paying attention.*
>
> *No, nothing.*

A few visitors (8%) learned about **what a microbe is, and what it does**.

> *What microbes were.*
>
> *I've never seen a picture of bacteria.*
>
> *It's about bacteria.*

A few visitors (3%) learned that **microbes could be good for humans**.

> *How they (microbes) help my body.*
>
> *Viruses could be for good purposes.*
>
> *There were so many microbes and some were actually helpful.*

And 8% of visitors gave responses that did not fit into any of these categories.

> *How the ear worked, how the eardrum works*. (The ear exhibit referenced here was an adjacent permanent exhibit in the hall, not a part of *Zoo in You*.)
>
> *Reaffirm not to just use antibiotics all the time. I already knew that but it reaffirmed it.*

Visitors were asked what they thought was the main idea of the *Zoo in You* exhibition (see **Table 8**). More than a third of general visitors to OMSI (34%) said the main idea of the exhibition was showing how the human body works. Almost a third of visitors (31%) thought the exhibition's goal was teach about microbes, viruses and bacteria in general. Some OMSI visitors (13%) believed that the exhibition showed microbes could be good and bad. A few visitors (6%) said the exhibition taught about being healthy and how to maintain human health. A few visitors (3%) made reference to specific exhibit elements, and a few visitors (3%) were not sure what was the main idea of the *Zoo in You* exhibition. And 9% of visitors gave responses that did not fit into any of these categories.

**Table 8: General Visitor Perceptions of The Main Idea of *Zoo in You* at OMSI**

| Response | Number of participants (n=90) | Percentage |
|---|---|---|
| How your body works | 31 | 34% |
| About microbes in general | 28 | 31% |
| Microbes can be good and bad | 12 | 13% |
| Health and being healthy | 5 | 6% |
| Reference to specific exhibit element | 3 | 3% |
| I don't know | 3 | 3% |
| Miscellaneous | 8 | 9% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

More than a third of general visitors to OMSI (34%) said the main idea of the exhibition was **showing how the human body works**.

> *Germs and viruses in you make you function, how you function.*
>
> *Letting people know what you're made up of, what goes on inside your body.*
>
> *Teaching you about your body and the things going on inside your body.*

Almost a third of visitors (31%) thought the exhibition's goal was to **teach about microbes, viruses and bacteria in general.**

> *Germs and disease.*
>
> *The bacteria.*
>
> *Germs and people.*

Some OMSI visitors (13%) believed that the exhibition showed that **microbes could be good or bad.**

> *They're all around you there are big and small things. Some can go away, some are good and some are bad.*
>
> *The gut ones are good and the hand ones are bad.*
>
> *It's kind of like the bacteria lobby. There are both good and bad bacteria. It's making kids aware of both types.*

A few visitors (6%) said the exhibition taught people about **being healthy and how to maintain human health.**

> *How to be more healthy. It's better to be clean, take care of yourself.*
>
> *To discuss how microbes are healthy for you. Also there's unhealthy stuff. It's ok to pick up a baby's pacifier and put it in their mouth.*
>
> *How to stay healthy.*

A few visitors (3%) made reference to **specific exhibit elements**.

> *About DNA testing.*
>
> *Wash your hands.*
>
> *The kids will say washing their hands. The effects of bacteria and how to kill them out.*

A few visitors (3%) were **not sure what was the main idea of the *Zoo in You* exhibition**.

> *I don't know.*
>
> *I couldn't even tell you.*

And 9% of visitors gave responses that did not fit into any of these categories.

> *Pick up things from all your interactions.*

General visitors were informed that one of the main ideas about the exhibition was *"Our bodies are a complex ecosystem that we are just beginning to explore."* Visitors were asked what parts of the exhibition did a good job communicating that message (see **Table 9**). Almost a third of visitors (31%) reported not learning or seeing that message anywhere specific within the *Zoo in You* exhibition. The exhibit elements mentioned by general visitors to OMSI were tallied, with the elements most often mentioned being the How Tiny interactive (17%) and the Marble Maze game (10%). Just less than 10% of visitors felt that many or all of the exhibit elements communicated the main idea.

**Table 9: Exhibit Elements That Communicated the Main Idea at OMSI**

| Response | Number of participants (n=90) | Percentage |
|---|---|---|
| I didn't find anything, I don't know | 28 | 31% |
| How Tiny | 15 | 17% |
| Marble Maze game | 9 | 10% |
| Everything/ multiple elements | 8 | 9% |
| Hand Washing | 7 | 8% |
| MVP Puzzle | 6 | 7% |
| Meet the Microbes intro panel | 6 | 7% |
| Ear exhibit (not part of *Zoo in You*) | 6 | 7% |
| DNA puzzle | 5 | 6% |
| Weather Report | 4 | 4% |
| Microbes in Balance game | 2 | 2% |
| Microbe Mirror interactive | 2 | 2% |
| Under the Lens microscope | 1 | 1% |
| Build a Phage | 1 | 1% |
| Bacteriophage Sculpture | 1 | 1% |
| Stories and Choices | 1 | 1% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Visitors were asked which parts of the *Zoo in You* exhibition worked best for their group (see **Table 10**). General visitors to OMSI most often mentioned Hand Washing (20%), the DNA Puzzle (17%), the Marble Maze game (14%) and Weather Report (14%). A small percentage of visitors (10%) said that anything interactive works especially well for their group. Smaller percentages of visitors mentioned other exhibit elements that worked well for their group. And 4% of visitors gave responses that did not fit into any of these categories.

**Table 10: What Worked Best for General Visitor Groups at OMSI**

| Response | Number of participants (n=90) | Percentage |
|---|---|---|
| Hand Washing | 18 | 20% |
| DNA Puzzle | 15 | 17% |
| Marble Maze game | 13 | 14% |
| Weather Report | 13 | 14% |
| Anything interactive | 8 | 10% |
| How Tiny interactive | 7 | 8% |
| MVP Puzzle | 6 | 7% |
| Build a Phage | 4 | 4% |
| Ear exhibit (not part of *Zoo in You*) | 4 | 4% |
| Under the Lens microscope | 3 | 3% |
| Microbes in Balance game | 2 | 2% |
| Microbe Mirror interactive | 2 | 2% |
| Meet the Microbes intro panel | 1 | 1% |
| Photo Opportunity | 1 | 1% |
| Bacteriophage Sculpture | 0 | 0% |
| Stories and Choices | 0 | 0% |
| Miscellaneous | 4 | 4% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

When asked if they remembered seeing or hearing the term "human microbiome" anywhere in the exhibition, the majority of general visitors to OMSI (72%) did not remember encountering the term (see **Table 11**). A little more than one in five visitors (20%) did remember seeing or hearing the term.

**Table 11: Did Visitors See the Term "Human Microbiome" at OMSI**

| Response | Number of participants (n=82) | Percentage |
|---|---|---|
| Yes, I saw "human microbiome" | 17 | 21% |
| No, I didn't see this | 65 | 79% |

Data collectors followed up with visitors and asked what stood out most to them about the term "human microbiome" (see **Table 12**). Of those OMSI visitors who said they did

remember seeing or hearing the term, visitors most often (35%) said they could not remember exactly where they saw it. A small percentage of visitors mentioned exhibit elements where they remembered seeing or hearing the term "human microbiome" like the How Tiny interactive (18%), Meet the Microbes intro panel (12%), the DNA Puzzle (12%), Hand Washing interactive (6%), the Marble Maze game (6%), and Weather Report (6%). And 6% of visitors gave responses that did not fit into any of these categories.

**Table 12: If Saw Term "Human Microbiome" What Stood out, at OMSI**

| Response | Number of participants (n=17) | Percentage |
|---|---|---|
| I saw it, but don't remember where | 6 | 35% |
| How Tiny interactive | 3 | 18% |
| Meet the Microbes intro panel | 2 | 12% |
| DNA Puzzle | 2 | 12% |
| Hand Washing | 1 | 6% |
| Marble Maze game | 1 | 6% |
| Weather Report | 1 | 6% |
| Miscellaneous | 1 | 6% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

General visitors to OMSI were asked if having the exhibition in English and Spanish enhanced, detracted from, or made no difference to their experience (see **Table 13**). The majority of visitors (72%) said having both languages did not make a difference to their experience, and almost a fifth of visitors (20%) said it enhanced their experience. A small number of visitors (8%) said having the exhibition in English and Spanish detracted from their experience. For general visitors, almost everyone said the bilingual interpretation was not detracting from their experience, which is counter to some opinions in the museum field that more than doubling the amount of text would be an issue for non-Spanish speaking visitors. This was not found to be the case.

**Table 13: Visitor Reactions to Bilingual Exhibition at OMSI**

| Response | Number of participants (n=86) | Percentage |
|---|---|---|
| Made no Difference | 62 | 72% |
| Enhanced the visit | 17 | 20% |
| Detracted from the visit | 7 | 8% |

Data collectors followed up with visitors and asked why, specifically, having the exhibition in both English and Spanish affected or did not affect their experience.

Visitors who said **it did not make a difference for them** (72%) gave some of the following responses:

*Can't read or speak Spanish.*

*Used to it. I'm from Texas, everything is in Spanish.*

*Only read the English.*

*I speak Spanish, but I didn't read it.*

*It's easy to press the English button.*

*But I'm glad to see it.*

Visitors who said it **enhanced their experience** (20%) gave some of the following responses:

*Can speak and read both languages.*

*Speak a little. Makes it more accessible for wider audience. Should include French.*

*Younger child is learning Spanish. It's some place that's more inclusive. That's good. It's important to know there are lots of different kinds of people.*

*We speak Spanish so it's nice to have it and be able to read the stuff in Spanish.*

*There's a lot of kids who speak different languages and it makes it something lots of people can do.*

Visitors who said it **detracted from their experience** (8%) gave some of the following responses:

*Sometimes we couldn't get English to pop up* (probably referring to malfunction in microbe mirror hands on activity).

*Had to set some to English first. Kids had a hard time with this.*

*There was one place where there was no English at all.* (Weather Report - in Spanish mode and visitor didn't realize someone had selected it)

Visitors were asked to answer, on a scale from 1 to 7, with 1 being "strongly disagree" and 7 being "strongly agree," three questions that directly related to the goals of the *Zoo in You* project. General visitors to OMSI gave generally positive ratings in response to these questions (see **Table 14**). There was a good bit of consistency in how well the exhibition achieved its main goals, since the averages ranged from 5.0 to 5.3; these are also relatively strong agreement ratings, above the middle point of neither agreeing nor disagreeing.

**Table 14: Ratings by Participants in the General Visitor Study at OMSI**

| Today's visit… | Average | (Strongly disagree) 1 | 2 | 3 | 4 | 5 | 6 | (Strongly agree) 7 |
|---|---|---|---|---|---|---|---|---|
| Helped me learn about the microbes in my own body (n=83) | 5.0 | 4% | 5% | 5% | 15% | 35% | 22% | 16% |
| Increased my understanding of the interactions between my body, my microbes and my environment (n=81) | 5.2 | 3% | 3% | 9% | 11% | 28% | 32% | 15% |
| Made me want to learn more about what scientists are discovering about microbes and health (n=82) | 5.3 | 1% | 2% | 9% | 12% | 27% | 28% | 21% |

Note: Scale was from 1 (Strongly disagree) to 7 (Strongly agree)

*Bacteriophage Sculpture* exhibit element

## Analysis - ScienceWorks

### Timing and Tracking

Of the 24 individuals tracked in *Zoo in You* at ScienceWorks, times ranged from 2 minutes 28 seconds to 43 minutes and 55 seconds (six participants in the ScienceWorks study were not tracked through the exhibition, only interviewed). The median time was 15 minutes 0 seconds, meaning that the average group spent 15 minutes in the exhibition; median is used as it is the middle number, and is not skewed by larger or smaller numbers disproportionately (as the mean is).

In terms of the number of stops made, the average number of elements stopped at in ScienceWorks (out of 14 total exhibit elements) was 8.3; the average group stopped at more than half of the exhibit elements (59%). See **Table 15** for a complete list of the number of stops made by visitors during their visit to *Zoo in You* at ScienceWorks.

**Table 15: Total Number of Elements Stopped at (out of 14), at Science Works**

| Number of Elements Stopped At | Number of participants (n=24) | Percentage |
|---|---|---|
| 0 | 0 | 0% |
| 1 | 0 | 0% |
| 2 | 0 | 0% |
| 3 | 1 | 4% |
| 4 | 1 | 4% |
| 5 | 4 | 17% |
| 6 | 2 | 8% |
| 7 | 2 | 8% |
| 8 | 1 | 4% |
| 9 | 3 | 13% |
| 10 | 3 | 13% |
| 11 | 4 | 17% |
| 12 | 2 | 8% |
| 13 | 1 | 4% |
| 14 | 0 | 0% |

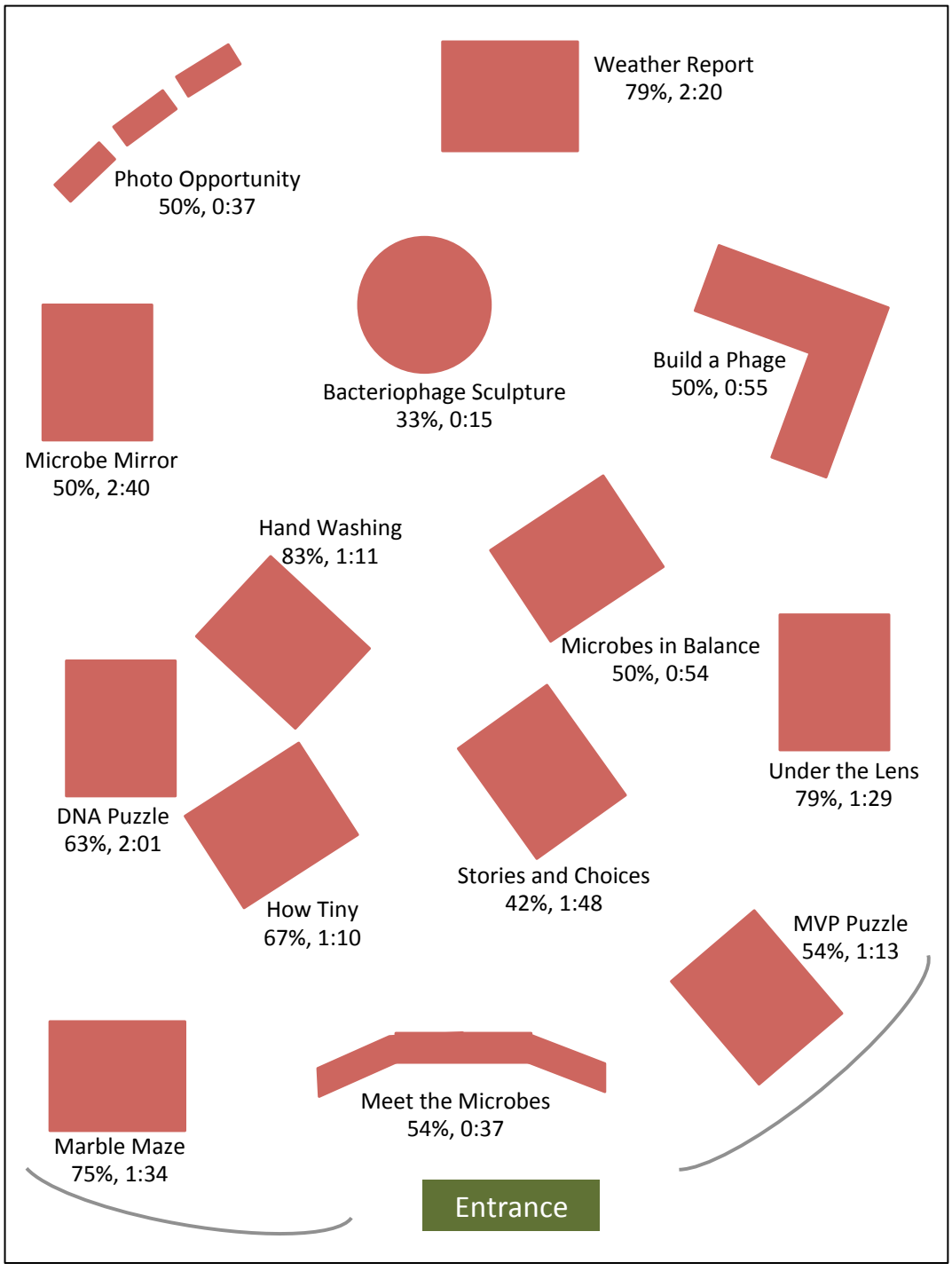
For those visiting *Zoo in You* at ScienceWorks, the most popular exhibit elements were the Hand Washing station (83%), Under the Lens (79%), Weather Report (79%), and the Marble Maze (75%). These were followed by How Tiny (67%) and the DNA Puzzle (63%). The median percent for an exhibit element was 54%, meaning that on average an exhibit element was likely to attract around one half of the groups visiting *Zoo in You*.

In looking at the median time for those who engaged with specific exhibit elements, three of the components had a stay time of over two minutes: Microbe Mirror (2:40), Weather Report (2:20), and DNA Puzzle (2:01). The next highest were Stories and Choices (1:48), Marble Maze (1:34), Under the Lens (1:29), Most Valuable Players (1:13), Hand Washing (1:11), and How Tiny (1:10) There were an additional number of components that had a stay time of one minute or just over: Weather Report, How Tiny, Microbes in Balance, and Stories and Choices. The rest had a stay time of under one minute (see **Table 16** and **Figure 2**). See Appendix B for rendered drawings of the exhibit components on the floor at OMSI.

**Table 16: Percentage Engaging and Time at Exhibit Components, at Science Works**

| Exhibit Element | Number of participants (n=24) | Percentage | Median Time (those who engaged) |
|---|---|---|---|
| Hand Washing | 20 | 83% | 1 min. 11 sec. |
| Under the Lens | 19 | 79% | 1 min. 29 sec. |
| Weather Report | 19 | 79% | 2 min. 20 sec. |
| Marble Maze | 18 | 75% | 1 min. 34 sec. |
| How Tiny | 16 | 67% | 1 min. 10 sec. |
| DNA Puzzle | 15 | 63% | 2 min. 1 sec. |
| MVP Puzzle | 13 | 54% | 1 min. 13 sec. |
| Meet the Microbes | 13 | 54% | 37 sec. |
| Build a Phage | 12 | 50% | 55 sec. |
| Microbe Mirror | 12 | 50% | 2 min. 40 sec. |
| Microbes in Balance | 12 | 50% | 54 sec. |
| Photo Opportunity | 12 | 50% | 37 sec. |
| Stories and Choices | 10 | 42% | 1 min. 48 sec. |
| Bacteriophage Sculpture | 8 | 33% | 15 sec. |

**Figure 2: Map of Engagement and Stay Times of Exhibit Components at Science Works (n=24)**



### Interview

General visitors were asked to complete this sentence about their visit to the *Zoo in You* exhibition: "I never realized that…" Visitors to ScienceWorks most often (30%) referenced learning something from a particular part of the *Zoo in You* exhibition (see **Table 17**). General visitors also reported learning what a microbe is (20%), about the number of microbes humans have on their bodies and in their bodies (17%). Some visitors (13%) said they already knew about the human microbiome. A few visitors (10%) learned about the small size of microbes, and a few visitors (7%) learned that microbes could be good for humans. A small number of visitors to ScienceWorks (7%) said they did not read much while visiting the exhibition, or they weren't sure they had learned anything during their visit. And 10% of visitors gave responses that did not fit into any of these categories.

Note: For open-ended responses, direct quotes are provided in italics.

**Table 17: What General Visitors Learned at *Zoo in You* at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| Reference of specific part of exhibition | 9 | 30% |
| What a microbe is | 6 | 20% |
| We have so many microbes on us and in us | 5 | 17% |
| I already knew about this topic | 4 | 13% |
| Miscellaneous | 3 | 10% |
| Microbes were small/size | 3 | 10% |
| I didn't read much/ I don't know | 2 | 7% |
| Microbes can be good for humans | 2 | 7% |
| Everything is new/ I didn't know any of this | 0 | 0% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Visitors to ScienceWorks most often (30%) referenced learning something from a **particular part of the *Zoo in You* exhibition**.

> *Hand washing- that there is that much stuff growing on us. The microscope was amazing. Intro panel comment- It's awesome to put a matching game in here.*
>
> *A person with acne could take bacteria from another person without acne and be cured. And the same thing about fecal matter. Would you let some one else test your fecal matter?*

*The nanometers, the perspective of how it zoomed. Helped me identify the perspective. The nanometer.*

General visitors to ScienceWorks also reported learning **what a microbe is** (20%).

*The actual shape of the viruses, the location of some of the different bacteria.*

*What germs look like. And how long it takes to wash them off your hands.*

*There were so many different types of bacteria.*

Some visitors learned about **the number of microbes humans have on their bodies** and in their bodies (17%).

*That there's so much bacteria, like trillions.*

*There are so many germs on your body.*

*All the germs on your hands. It's pretty gross.*

Some visitors (13%) said **they already knew about the human microbiome**.

*I'm an environmental science major. It's hard to answer. I didn't really learn anything new.*

*Nothing new. I'm living through this. I have some health issues.*

*I teach this. I'm a nursing instructor so I already know most of it.*

A few visitors (10%) learned about **the small size of microbes**.

*The viruses were that tiny. Very small.*

*The size of a cold virus was so tiny and can cause so much damage.*

A few visitors (7%) learned that **microbes could be good for humans**.

*That there are good and bad microbes. Some germs can make you sick.*

*It's a good reminder we have good and bad microbes. We forget about the good ones.*

A small number of visitors to ScienceWorks (7%) said they **did not read much while visiting the exhibition, or weren't sure they had learned anything** during their visit.

*Nothing, really.*

And 10% of visitors gave responses that did not fit into any of these categories.

*Some of the scientific names. My Spanish improved dramatically.*

*Your hands were dry, your armpits are wet.*

*That it would have so much stuff.*

Visitors were asked what they thought was the main idea of the *Zoo in You* exhibition (see **Table 18**). Almost a third of general visitors to ScienceWorks (30%) thought the exhibition's goal was teach about microbes, viruses and bacteria in general. One fifth of visitors (20%) said the main idea of the exhibition was showing how the human body works. And 20% of ScienceWorks visitors believed that the exhibition taught about being healthy and how to maintain human health. Some ScienceWorks visitors (17%) thought the exhibition showed that microbes could be good and bad. A few visitors (3%) were not sure what was the main idea of the *Zoo in You* exhibition. And 10% of visitors gave responses that did not fit into any of these categories.

**Table 18: General Visitor Perceptions of The Main Idea of *Zoo in You* at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| About microbes in general | 9 | 30% |
| How your body works | 6 | 20% |
| Health and being healthy | 6 | 20% |
| Microbes can be good and bad | 5 | 17% |
| I don't know | 1 | 3% |
| Miscellaneous | 3 | 10% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Almost a third of general visitors to ScienceWorks (30%) thought the exhibition's goal was **teach about microbes, viruses and bacteria in general**.

*Blowing away our preconceptions about bacteria and microbes.*

*The human biome, biology, viruses.*

*It's about microbes.*

One fifth of visitors (20%) said the main idea of the exhibition was **showing how the human body works**.

> *How our body works. The human interaction with the microscopic world, with viruses.*
>
> *To learn about what is growing in and outside of your body too.*
>
> *Tell us about the environment that lives inside us. We all have universes inside us. "The small" is important. We can study the smallest, we can also make connections to the larger outer space. That we can't study.*

And 20% of ScienceWorks visitors believed that the exhibition taught about **being healthy and how to maintain human health**.

> *The health aspect, things to do to stay healthy.*
>
> *Certain microbes can help you be healthier, more resistant. Like from dogs. Or when the pacifier is dropped on the floor. People are so worried about things like that. We need dirt to be healthy.*
>
> *Good hygiene. Keep germs to a minimum.*

Some ScienceWorks visitors (17%) thought the exhibition showed that **microbes could be good and bad.**

> *Good bacteria and bad bacteria.*
>
> *There are microbes on and in us. Some are good and some are bad. You don't want to get rid of all of them.*
>
> *Some are good and some are bad. Most of them are good. You're always healthy when you have the good ones.*

A few visitors (3%) were **not sure what was the main idea of the *Zoo in You* exhibition**.

> *I don't know.*

And 10% of visitors gave responses that did not fit into any of these categories.

> *Keeping it real. No tricks, no illusions, no fantasy.*
>
> *I guess to interest kids in microbes.*

General visitors were informed that one of the main ideas about the exhibition was *"Our bodies are a complex ecosystem that we are just beginning to explore."* Visitors were asked what parts of the exhibition did a good job communicating that message (see **Table 19**). The exhibit elements mentioned by general visitors to ScienceWorks were tallied, with the elements most often mentioned being the Under the Lens microscope (23%), Weather Report (17%), the How Tiny interactive (17%) and the Hand washing interactive (13%). Just less than 10% of visitors felt that many or all of the exhibit elements communicated the main idea. Only 13% of general visitors to ScienceWorks reported not learning or seeing that message anywhere specific with the *Zoo in You* exhibition.

**Table 19: Exhibit Elements That Communicated the Main Idea at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| Under the Lens microscope | 7 | 23% |
| Weather Report | 5 | 17% |
| How Tiny interactive | 5 | 17% |
| MVP Puzzle | 5 | 17% |
| Hand Washing | 4 | 13% |
| I didn't find anything, I don't know | 4 | 13% |
| DNA Puzzle | 3 | 10% |
| Stories and Choices | 3 | 10% |
| Build a Phage | 2 | 7% |
| Microbe Mirror interactive | 2 | 7% |
| Everything/ multiple elements | 2 | 7% |
| Marble Maze game | 1 | 3% |
| Nuts exhibit (not part of *Zoo in You*) | 0 | 0% |
| Microbes in Balance game | 0 | 0% |
| Meet the Microbes intro panel | 0 | 0% |
| Bacteriophage Sculpture | 0 | 0% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Visitors were asked which parts of the *Zoo in You* exhibition worked best for their group (see **Table 20**). General visitors to ScienceWorks most often mentioned Weather Report (23%), the DNA Puzzle (20%), and the Hand Washing interactive (17%). A percentage of visitors (13%) said that anything interactive works especially well for their group. Smaller percentages of visitors mentioned other exhibit elements that worked well for their group.

**Table 20: What Worked Best for General Visitor Groups at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| Weather Report | 7 | 23% |
| DNA Puzzle | 6 | 20% |
| Hand Washing | 5 | 17% |
| How Tiny interactive | 4 | 13% |
| Microbe Mirror interactive | 4 | 13% |
| Anything interactive | 4 | 13% |
| Marble Maze game | 3 | 10% |
| MVP Puzzle | 3 | 10% |
| Photo Opportunity | 3 | 10% |
| Build a Phage | 2 | 7% |
| Stories and Choices | 2 | 7% |
| Under the Lens microscope | 2 | 7% |
| Microbes in Balance game | 2 | 7% |
| Meet the Microbes intro panel | 1 | 3% |
| Nuts exhibit (not part of *Zoo in You*) | 1 | 3% |
| Bacteriophage Sculpture | 0 | 0% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

When asked if they remembered seeing or hearing the term "human microbiome" anywhere in the exhibition, the majority of general visitors to ScienceWorks (57%) did in fact remember encountering the term (see **Table 21**). About 43% of visitors did not remember seeing or hearing the term.

**Table 21: Did Visitors See the Term "Human Microbiome" at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| Yes, I saw "human microbiome" | 17 | 57% |
| No, I didn't see this | 13 | 43% |

Data collectors followed up with visitors who said they had seen the term and asked what stood out most to them about the term "human microbiome" (see **Table 22**). ScienceWorks visitors most often (18%) remembered seeing the term on the intro panel, "Meet the Microbes." A smaller number of visitors mentioned other exhibit elements where they saw the term "human microbiome," like the Microbe Mirror

interactive, the Stories and Choices interactive, the Microbes in Balance game, the Hand Washing interactive and Weather Report. About 6% of visitors said they saw the term, but could not remember where in the exhibition, and another 6% said they saw or heard the term in many places throughout the *Zoo in You* exhibition.

**Table 22: If Saw Term "Human Microbiome" What Stood Out, at ScienceWorks**

| Response | Number of participants (n=17) | Percentage |
|---|---|---|
| Meet the Microbes intro panel | 3 | 18% |
| Microbe Mirror interactive | 2 | 12% |
| Stories and Choices | 2 | 12% |
| Microbes in Balance game | 2 | 12% |
| Hand Washing | 2 | 12% |
| Weather Report | 2 | 12% |
| DNA Puzzle | 1 | 6% |
| How Tiny interactive | 1 | 6% |
| Marble Maze game | 1 | 6% |
| I saw it, but don't remember where | 1 | 6% |
| The term is in may places in the exhibition | 1 | 6% |
| Miscellaneous | 1 | 6% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

General visitors to ScienceWorks were asked if having the exhibition in English and Spanish enhanced, detracted from, or made no difference to their experience (see **Table 23**). The majority of visitors (73%) said having both languages did not make a difference to their experience, and almost a quarter of visitors (23%) said it enhanced their experience. A small number of visitors (3%) said having the exhibition in English and Spanish detracted from their experience. For general visitors, almost everyone said the bilingual interpretation was not detracting from their experience, which is counter to some opinions in the museum field that more than doubling the amount of text would be an issue for non-Spanish speaking visitors. This was not found to be the case.

**Table 23: Visitor Reactions to Bilingual Exhibition at ScienceWorks**

| Response | Number of participants (n=30) | Percentage |
|---|---|---|
| Made no Difference | 22 | 73% |
| Enhanced the visit | 7 | 23% |
| Detracted from the visit | 1 | 3% |

Data collectors followed up with visitors and asked why, specifically, having the exhibition in both English and Spanish affected or did not affect their experience.

Visitors who said it **did not make a difference for them** (73%) gave some of the following responses:

> *If more people can enjoy it, who am I to criticize?*
>
> *It's fine.*
>
> *It's helpful for people. It's important to include Spanish speakers.*
>
> *They don't distract, but you do need to sort through the reading a little bit.*
>
> *I didn't realize it was in Spanish.*
>
> *It just didn't make a difference.*

Visitors who said it **enhanced their experience** (23%) gave some of the following responses:

> *I'm learning Spanish, so it was good. In the (DNA Puzzle) the Spanish-English didn't match in one part.*
>
> *It's nice to have more opportunities for more people who speak other languages. It would be really helpful to people who speak Spanish. And depending on where the exhibit goes it might be important.*
>
> *It's good for those who do speak Spanish, it makes it accessible.*
>
> *My son was over there saying things he was reading in Spanish. I think they learn a little in school.*
>
> *It's great. We have a diverse culture around here. I noticed that. It's good.*

Visitors who said it **detracted from their experience** (3%) gave some of the following responses:

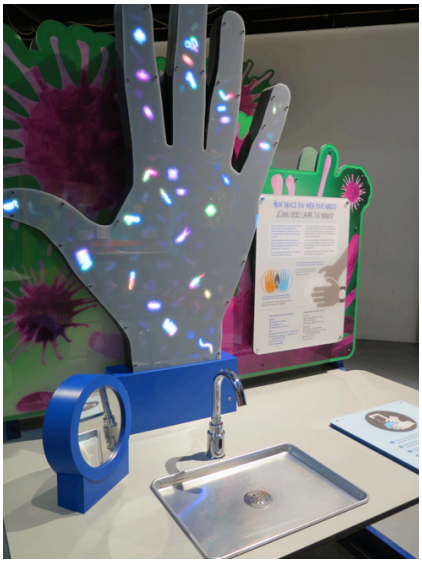
> *I don't speak Spanish. I kept starting to read the Spanish because it was on the right side.*

Visitors were asked to answer, on a scale from 1 to 7, with 1 being "strongly disagree" and 7 being "strongly agree," three questions that directly related to the goals of the *Zoo in You* project. General visitors to ScienceWorks gave generally positive ratings in response to these questions (see **Table 24**). Once again there was a good bit of consistency in how well the exhibition achieved its main goals, since the averages ranged from 5.5 to 5.7; these are relatively strong agreement ratings.

**Table 24: Ratings by Participants in the General Visitor Study at ScienceWorks**

| Today's visit… | Average | (Strongly disagree) 1 | 2 | 3 | 4 | 5 | 6 | (Strongly Agree) 7 |
|---|---|---|---|---|---|---|---|---|
| Helped me learn about the microbes in my own body (n=29) | 5.5 | 0% | 0% | 3% | 14% | 41% | 17% | 24% |
| Increased my understanding of the interactions between my body, my microbes and my environment (n=29) | 5.7 | 0% | 0% | 3% | 7% | 38% | 24% | 28% |
| Made me want to learn more about what scientists are discovering about microbes and health (n=29) | 5.7 | 3% | 0% | 3% | 14% | 10% | 35% | 35% |

Note: Scale was from 1 (Strongly disagree) to 7 (Strongly agree)



*Hand Washing* exhibit element

## FINDINGS: *Family Science Night Study*

Note: In the findings section not all of the sample sizes for the tables will match the total number of participants in the study. Typically, this is because the participant did not answer a question or fill out part of the demographic survey. When not everyone answered a question the percentage is divided by the number of respondents and not the number of participants.

### Sample

Family Science Nights offer a unique experience for a school's families and teachers to visit the museum and spark lifelong interest in science. This event for schools is designed to foster community between teachers, parents and students, and strengthen parent and family involvement in science exploration and discovery. Participants explore the popular exhibit halls, as well as the Physics Lab and Life Science Lab, engaging in exciting hands-on activities. An OMSI specialist works with the school or Parent Teacher Association (PTA) to customize the event for each group, answer questions and tends to the logistics.

For this Family Science Night an OMSI staff member coordinated with an external recruiter working with Metropolitan Family Service of Portland to recruit Hispanic/Latino families. Metropolitan Family Service (MFS) is an non-profit organization that provides family services such as counseling, child services, and parent educational services to families in need of the Portland Metro area. OMSI staff worked closely with a program coordinator with MFS to recruit Hispanic/Latino families for this event. Data collection occurred during Family Science Night at OMSI, a special event held at OMSI on July 20, 2015. Attendees were intercepted during their visit and asked to participate in an interview. Bilingual data collectors were employed, and each data collector conducted interviews in English and/or Spanish with Spanish-speaking visitors (visitors chose the language they preferred).

Almost nine out of 10 (85%) of the survey participants were female, while 16% were male (see **Table 25**). In terms of the age, more than half of the participants (53%) were from 31 to 40 years old, another 19% were between 26 and 30 years, and another 12% between 41 and 50 years old. A second age-related item asked about the ages of the other people in their groups. As can be seen in **Table 25** many of those accompanying the adults were children: 30% were 0 to 5, another 30% were 6 to 11, and 11% were 12 to 18 years old. It is important to note that for this event only groups with children in the target age range were recruited, so this result is not surprising. Some of them did visit with other adults, as 39% of the other members were adults 19 years and older. More than 90% of participants in OMSI Family Science Night lived in Oregon. A very small percentage (3%) lived in other western states or lived other parts of the United States or were international visitors (6%).

**Table 25: Demographics for Participants in Family Science Night**

| Characteristic | Number of participants (n=43) | Percentage |
|---|---|---|
| ***Gender*** | ***n=39*** | ***Percentage*** |
| Female | 33 | 85% |
| Male | 6 | 15% |
| ***Age Category of Respondent*** | ***n=43*** | ***Percentage*** |
| 6 to 11 | 0 | 0% |
| 12 to 18 | 0 | 0% |
| 19 to 25 | 3 | 7% |
| 26 to 30 | 8 | 19% |
| 31 to 40 | 23 | 53% |
| 41 to 50 | 5 | 12% |
| 51 to 60 | 0 | 0% |
| 61 and above | 4 | 9% |
| ***Age of Other Group Members*** | ***37 Groups*** | ***Percentage*** |
| 0 to 5 | 41 | 30% |
| 6 to 11 | 41 | 30% |
| 12 to 18 | 15 | 11% |
| 19 to 25 | 9 | 7% |
| 26 to 30 | 12 | 9% |
| 31 to 40 | 16 | 12% |
| 41 to 50 | 2 | 1% |
| 51 to 60 | 1 | <1% |
| 61 and above | 0 | 0% |
| Number of other group members | 137 | 100% |
| ***Location of Visitors*** | ***n=34*** | ***Percentage*** |
| Live in Oregon | 31 | 91% |
| Live in western United States | 1 | 3% |
| Live outside of western United States | 2 | 6% |
| ***Race of Participants*** | ***n=26*** | ***Percentage*** |
| Hispanic or Latino (write-in) | 17 | 65% |
| Caucasian or White | 9 | 35% |
| Asian | 0 | 0% |
| Other | 0 | 0% |
| American Indian or Alaska Native | 0 | 0% |
| African American or Black | 0 | 0% |
| ***Latino/Hispanic/Spanish Origin of Participants*** | ***n=39*** | ***Percentage*** |
| Latino/Hispanic/Spanish origin | 38 | 97% |
| Non- Latino/Hispanic/Spanish origin | 1 | 3% |

**Table 25: Demographics for General Public Visitors at ScienceWorks, continued**

| ***Language Spoken at Home by Participants*** | ***Number of participants (n=39)*** | ***Percentage*** |
|---|---|---|
| Spanish | 33 | 83% |
| Spanish and English | 4 | 10% |
| English | 3 | 8% |
| ***Previous OMSI Attendance*** | ***n=40*** | ***Percentage*** |
| Have visited before | 30 | 75% |
| First visit to OMSI | 10 | 25% |
| ***OMSI Membership of Participants*** | ***n=40*** | ***Percentage*** |
| Non-member | 37 | 93% |
| Member | 3 | 8% |

Two items were included about race/ethnicity. The first asked for visitors to choose their race, and over a third (39%) did not respond. Of those who did respond, all participants either checked the Caucasian/White box, or wrote in Hispanic/Latino in the "Other" option. Another item specifically asked if participants were of Hispanic, Latino or Spanish origin. For Family Science Night, 97% said they were of Latino/Hispanic/Spanish origin.

When asked an open-ended question about the languages spoken regularly at home, 83% said they spoke only Spanish regularly, 10% said they spoke Spanish and English, while just 8% said they regularly spoke English at home.

It was also important to know about any prior experience and connections participants had to OMSI. Three quarters (75%) had been to OMSI before, while one quarter (25%) had never been. The large majority (93%) were not members of OMSI. Most participants (84%) generally felt they were likely to return to OMSI in the future (see **Table 26**).

**Table 26: Likelihood of Returning, Participants in Family Science Night**

| Rating | **(Not at all likely) 1** | **2** | **3** | **4** | **5** | **6** | **(Very likely) 7** |
|---|---|---|---|---|---|---|---|
| (n=40) | 0 | 0 | 1 | 1 | 2 | 9 | 27 |
| Percentage of Participants | 0% | 0% | 2% | 2% | 5% | 21% | 63% |

Note: Scale was from 1 (Not at all likely) to 7 (Very likely)

## Analysis

A series of three rating items asked how much of an impact the exhibition being bilingual had on peoples' experiences in *Zoo in You*, from not at all to a lot (see **Table 27**). All of the scores were between 5.5 and 5.9, with the highest being helping them engage with different parts of the exhibition, followed by the ability to understand the exhibition content, and how they interacted with other members of the group.

**Table 27: Rating for Participants at Family Science Night**

| **How much did the *Zoo in You* exhibition being in Spanish affect the following:** | **Average** | **(Not at all) 1** | **2** | **3** | **4** | **5** | **6** | **(A lot) 7** |
|---|---|---|---|---|---|---|---|---|
| How much you engaged with different parts of exhibit (n=40) | 5.9 | 0% | 0% | 3% | 14% | 41% | 17% | 24% |
| Your ability to understand the exhibit content (n=40) | 5.7 | 0% | 0% | 3% | 7% | 38% | 24% | 28% |
| How much you interacted with other people in your group (n=40) | 5.5 | 3% | 0% | 3% | 14% | 10% | 35% | 35% |

Note: Scale was from 1 (Not at all) to 7 (A lot)

*Under the Lens* exhibit element

Asked what they thought the exhibition was about, visitors most often mentioned microbes (38%) and the human body (29%) (see **Table 28**). These were followed by health (21%), bacteria and viruses (21%), learning and knowledge (19%) and how to take care of or fight bacteria (10%). The rest of the specific responses each represented less than 10% of participants.

**Table 28: What Visitors Thought the Exhibition Was About at Family Science Night**

| Response | Number of participants (n=42) | Percentage |
|---|---|---|
| *Microbios, microorganismos*<br>Microbes, microorganisms | 16 | 38% |
| *El cuerpo humano*<br>The human body | 12 | 29% |
| *Salud, la vida*<br>Health, life | 9 | 21% |
| *Bacteria, virus*<br>Bacteria, virus | 9 | 21% |
| *Apredizaje, conocimento*<br>Learning, knowledge | 8 | 19% |
| *Como cuidar [el cuerpo], combatir bacteria*<br>How to take care of [the body], fight bacteria | 4 | 10% |
| *Cosas afuera del cuerpo*<br>Things outside the body | 2 | 5% |
| *Como afectan a los humanos*<br>How they affect humans | 2 | 5% |
| *Lo bueno y lo malo*<br>The good and the bad | 1 | 2% |
| *Respuestas variadas*<br>Miscellaneous | 9 | 21% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Note: For open-ended responses, direct quotes are provided in italics. If the response was in Spanish an English translation follows, in brackets.

A little more than a third of those attending Family Science Night (38%) thought the exhibition's goal was about **microbes or microorganisms**.

> *Microrganismos dentro tu cuerpo. [Microorganisms in your body]*
>
> *Los diferentes microbios a los que somos expuestos. [The different microbes we are exposed to.]*
>
> *Los microbios que existen en las diferentes partes de nuestro cuerpo. [The microbes that exist in different parts of our body.]*

Another 29% said it had to do with **the human body**.

> *It's about your body and what happens when you're sick.*
>
> *Para aprender un poco más de como funcionan ciertas partes del cuerpo humano. [To learn a little more about how certain parts of the human body function.]*
>
> *Nuestro cuerpo y los microorganismos que hay en nuestro cuerpo. [Our body and the microorganisms that are in our body.]*

And 21% of Family Science Night participants thought it was about **health or life**.

> *Health, life and aging. It was fun.*
>
> *Que importante es la vida... [How important life is…]*
>
> *La salud familia. [Family health.]*

There were another 19% who said it was about **learning, knowledge**.

> *De que los niños aprendan un poco de todo de lo que tenemos en la vida diaria. [So kids can learn a little bit about all that we have in daily life.]*
>
> *Yo pienso que para aprender un poco y para ayudar nuestras familias.* [I think to learn a little and help our families.]

And 10% of participants said it was about **taking care of the body or fighting bacteria**.

> *De como podemos evitar los microbios. [How we can avoid microbes.]*
>
> *Explicar como combatir los microbios y darse cuenta en donde están. [Explain how to combat microbes and realize where they are.]*

There was an interest in finding out whether participants were noticing the term "human microbiome"; more than three quarters (79%) said they did see the term in the exhibition (see **Table 29**). When asked what stood out for them regarding the term, they talked about microbes and the number of microbes (35%), learning about it (26%), that researchers are studying microbes (13%) and how to care for the body in terms of microbes (13%). Few of the responses specifically talked about what the human microbiome was, or what it was made up of (see **Table 30**).

**Table 29: Visitors Who Saw the Term "Human Microbiome" in the Exhibition During Family Science Night**

| Response | Number of participants (n=42) | Percentage |
|---|---|---|
| Yes, I saw "human microbiome" | 33 | 79% |
| No, I didn't see this | 9 | 21% |

**Table 30: If Saw Term "Human Microbiome" What Stood Out at Family Science Night**

| Response | Number of participants (n=31) | Percentage |
|---|---|---|
| *Los microbios, la cantidad*<br>Microbes, the number of them | 11 | 35% |
| *Estamos estudiando los microbios*<br>That we are studying microbes | 4 | 13% |
| *Cómo entramos en contacto con los microbios*<br>How we come in contact with microbes | 4 | 13% |
| *Lo que hacemos para el cuerpo*<br>What we do for the body | 3 | 10% |
| *Parte específica de la exhibición*<br>Specific part of exhibition | 3 | 10% |
| *El tamaño de los microbios*<br>The size of microbes | 3 | 10% |
| *Los microbios pueden ser buenos o malos*<br>Microbes can be good or bad | 3 | 10% |
| *Respuestas variadas*<br>Miscellaneous | 4 | 13% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

A little more than a third (35%) talked about **the number of microbes**.

> *La cantidad de microbios que tenemos en el cuerpo. [The number of microbes we have in our bodies.]*
>
> *Todos los microbios que podemos tener sin darnos cuenta. [All the microbes we have without realizing it.]*
>
> *La cantidad de microbios en las manos. [The number of microbes on our hands.]*

Another 13% talked about how **we are studying microbes**.

> *La investigación profunda que están haciendo para proteger nuestros cuerpos. [The intensive research being done to protect our bodies.]*
>
> *Que están estudiando más para aprender más sobre los microbios. [That they are studying more to learn about the microbes.]*

An additional 13% mentioned **how we come into contact with microbes**.

> *Que tanto humanos mas cosas tienen micro biomas o microbios que pueden estar en lugares que tocan. [That humans and things have microbiomes or microbes that can be in places we touch.]*
>
> *Los niños al nacer son expuestos a esa bacteria. [Children being born are exposed to those bacteria.]*

When asked whether the exhibition being bilingual enhanced, detracted from, or made no difference to their visit, almost all of the participants (91%) said it enhanced the visit (see **Table 31**). A little less than one in ten (9%) said it made no difference, and no one said it detracted from the visit. Those who said it enhanced their visit were asked why, and they were most likely to say it helped them understand or learn better (50%), they or someone in their group doesn't speak English (21%), or that their first language is Spanish (13%) (see **Table 32**).

**Table 31: Visitor Reactions to Bilingual Exhibition During Family Science Night**

| Response | Number of participants (n=43) | Percentage |
|---|---|---|
| Enhanced the visit | 39 | 91% |
| Made no difference | 4 | 9% |

**Table 32: If Said "Enhanced" Why Did They Say That**

| Response | Number of participants (n=38) | Percentage |
|---|---|---|
| *Entender, aprender mejor*<br>Understand, learn better | 19 | 50% |
| *Alguien en el grupo no habla inglés*<br>Someone in the group doesn't speak English | 8 | 21% |
| *Mi primer idioma es español*<br>My first language is Spanish | 5 | 13% |
| *Yo soy bilingüe*<br>I'm bilingual | 2 | 5% |
| *Es mejor, mas abierto*<br>It's better, more open | 2 | 5% |
| *Respuestas variadas*<br>Miscellaneous | 5 | 13% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Half of the people (50%) said that Spanish enhanced the visit because **they understand or learn better** when it's in Spanish.

> *Porque así todos aprendemos más y todos sabremos de que se trata. [Because like that we can learn more and everyone understands what it's about.]*
>
> *Para entender las funciones de cada exhibición. [To understand the functions of each exhibit.]*
>
> *Podemos escoger el idioma que mejor entendamos. [We choose the language we understand best.]*

Another 21% said **they or someone in their group didn't speak English**.

> *Las personas que no saben english tienen la oportunidad de comprender exactamente que es lo que la exhibición esta tratando de comunicar. [People who don't know English have a chance to understand exactly what the exhibit is trying to communicate.]*
>
> *Porque pude tener mejor conocimiento acerca de la información que se ofrece. [Because I can have better knowledge about the information that is included.]*

An additional 13% said that **Spanish was their first language**.

> *Puedo entender a 100% porque mi primer lengua es español. [I can understand 100% because my first language is Spanish.]*
>
> *Por que los términos de ciertas palabras que no entendía las entendí en mi idioma. [Because certain words I didn't understand I understood in my own language.]*

Participants were asked whether the museum having the exhibition in Spanish changed how they felt about OMSI. Almost three quarters (70%) said it did, while 30% said it did not (see **Table 33**). For those who said it did change their opinion, they said it did because it helped them understand or learn better (40%), they or someone in their group only speaks Spanish (16%), it generally gave them a better opinion of OMSI (12%), or they prefer Spanish (12%) (see **Table 34**).Basically, they were more likely to answer why it changed their opinion than how. Those who said it did not change their opinion generally said that it was because they already had a high opinion of OMSI, independent of the language used in the exhibition.

**Table 33: Museum Having Exhibition in Spanish Change How Spanish Speakers Feel about OMSI**

| Response | Number of participants (n=40) | Percentage |
|---|---|---|
| Yes | 28 | 70% |
| No | 12 | 30% |

**Table 34: If Said Having Spanish Changed Visit, How**

| Response | Number of participants (n=32) | Percentage |
|---|---|---|
| *Entender, aprender mejor*<br>To understand or learn better | 14 | 44% |
| *Tener mejor opinión del museo*<br>Have a better opinion of the museum | 5 | 16% |
| *Alguien en el grupo no habla inglés*<br>Someone in the group doesn't speak English | 4 | 13% |
| *Es mejor, en general*<br>It's better, in general | 3 | 9% |
| *Prefiero el español* | 3 | 9% |
| *Es mas cómodo*<br>It's more comfortable | 2 | 6% |
| *Mas confianza*<br>More confidence | 2 | 6% |
| *Respuestas variadas*<br>Miscellaneous | 3 | 9% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Asked why having Spanish changed their view of the museum, almost half of the people (44%) said they were **able to understand or learn better**.

> *Es mucho mejor y mas entendible por que esta en nuestro idioma. [It's much better and easier to understand when it's in our language.]*
>
> *Por supuesto que si, así lo entenderían mejor las personas que no hablan ingles. [Of course, so like this people who don't speak English can understand more.]*
>
> *Por que todos podemos aprender y poder entender mejor. [Because we can all learn and understand more.]*

Another 16% simply said it **left them with a better opinion of the museum**.

> *Porque demuestra el gran interés que tienen, de que todos obtengamos la información. [Because it shows the interest they have, that we can all get the information.]*
>
> *Definitivamente me siento con mas comunidad y entender el mensaje de cada actividad. [It definitely makes me feel more part of the community, and to understand each activity's message.]*

Meanwhile, 13% said **they or someone in their group only speaks Spanish**.

> *Porque mi familia solo habla español. [Because my family only speaks Spanish.]*
>
> *Porque ahora personas que no hablan ni leen ingles pueden entender lo que ven y así pueden enseñarle a sus hijos. [Because now people who don't read English can understand what they are seeing and thus can teach it to their children.]*

*MVP Puzzle* exhibit element

## FINDINGS: *Science Café Study*

Note: In the findings section not all of the sample sizes for the tables will match the total number of participants in the study. Typically, this is because the participant did not answer a question or fill out part of the demographic survey. When not everyone answered a question the percentage is divided by the number of respondents and not the number of participants.

### Sample

OMSI hosts a series of events called OMSI Science Cafés. These events are organized by OMSI and take place at local restaurants, theaters and pubs. OMSI invites a guest speaker, usually a scientist, explorer or author, to give a talk about their work in an informal setting where guests can eat, drink and play trivia.

Data for the Science Café study was collected on Tuesday, August 18, 2015. On the night of data collection for this study, the guest speaker was Hernan Lorenzi of the J. Craig Venter Institute, who was a science advisor for the *Zoo in You* project. His talk focused on the human microbiome, in connection to the *Zoo in You* exhibition that was on display at OMSI. The presentation took place at the Empirical Theater on the OMSI museum campus. Attendance was impressively high, with every seat in the 300-person-capacity venue filled.

Individuals participating in the Science Café events were given a survey upon entry to the event, which included a table on which to score their trivia game and the questions included in the survey. Players were asked to complete the survey before leaving the event.

Participants in the Science Café study had a mostly even split between genders (53% male, 46% female), with one participant writing in the term “fluid” as a response to the open ended question (see **Table 35**). The large majority of participants were over the age of 21 years old. Surprisingly, over 40% of participants in Science Café were over 61 years old. We often assume that trivia nights are designed for young adults who are likely to look for social nightlife experiences, but it seems as though Science Café is attracting a much wider range of ages. More than three quarters of participants in Science Café (91%) lived in Oregon. A small percentage of participants (9%) came from other western states, mostly from nearby Vancouver, Washington.

**Table 35: Demographics for Participants in Science Café**

| Characteristic | Number of participants (n=142) | Percentage |
|---|---|---|
| ***Gender*** | ***n=132*** | ***Percentage*** |
| Female | 70 | 53% |
| Male | 61 | 46% |
| "Fluid" | 1 | 1% |
| ***Age Category of Respondent*** | ***n=142*** | ***Percentage*** |
| 6 to 11 | 0 | 0% |
| 12 to 18 | 6 | 4% |
| 19 to 25 | 15 | 11% |
| 26 to 30 | 13 | 9% |
| 31 to 40 | 14 | 10% |
| 41 to 50 | 15 | 11% |
| 51 to 60 | 20 | 14% |
| 61 and above | 59 | 41% |
| ***Location of Visitors*** | ***n=130*** | ***Percentage*** |
| Live in Oregon | 119 | 91% |
| Live in western United States | 11 | 9% |
| Live outside of western United States | 0 | 0% |
| ***Race of Participants*** | ***n=112*** | ***Percentage*** |
| Caucasian or White | 105 | 94% |
| Asian | 3 | 2% |
| Other | 3 | 2% |
| American Indian or Alaska Native | 1 | 1% |
| African American or Black | 0 | 0% |
| Hispanic or Latino | 0 | 0% |
| ***Latino/Hispanic/Spanish Origin of Participants*** | ***n=107*** | ***Percentage*** |
| Non- Latino/Hispanic/Spanish origin | 104 | 97% |
| Latino/Hispanic/Spanish origin | 3 | 3% |
| ***Previous OMSI Attendance*** | ***n=138*** | ***Percentage*** |
| Attended in last 12 months | 80 | 58% |
| Have not attended in last 12 months | 58 | 42% |
| ***OMSI Membership of Participants*** | ***n=142*** | ***Percentage*** |
| Non-member | 117 | 87% |
| Member | 18 | 13% |

**Table 35: Demographics for Participants in Science Café, continued**

| *Previous Science Café Attendance* | *Number of participants (n=142)* | *Percentage* |
|---|---|---|
| Have been to Science Café before | 101 | 73% |
| First time at Science Café | 37 | 27% |
| ***Range of Science Café Attendance*** | ***n=80*** | ***Percentage*** |
| 1 to 5 times | 42 | 52% |
| 6 to 10 times | 21 | 26% |
| 11 or more times | 17 | 21% |

The large majority of Science Café participants identified as White, with just 7% identifying as Asian, Native American or Other. There were no written responses to clarify the "Other" category. Only 3% of participants reported being Latino/Hispanic/Spanish in origin.

Over half of participants in Science Café had visited OMSI in the last year. However, only 13% of participants said they were members of OMSI.

Almost three quarters of participants (73%) in the Science Café study had previously been to a Science Café. Over half of participants (52%) in the Science Café study had attended between 1 and 5 times in the past, while 26% of participants had been to Science Café between 6 and 10 times, and 21% had attended Science Café more than 10 times.

*DNA Puzzle* exhibit element

## Analysis

Science Café attendees were asked what they thought was the main idea of the Science Café event that night (see **Table 36**). Over a third of participant (35%) thought the event's main idea was to teach about the human microbiome in general. Some participants (23%) said the goal of the evening was to teach people about being healthy and how to maintain human health. Other Science Café participants (19%) believed the topic of the event was meant to show how the human body works. A few participants (6%) mentioned that the event was fun or cool or interesting, and a few participants (6%) wrote that the main idea of the evening was to educate the guests. A small percentage (5%) said the main idea of the Science Café event was to show that microbes could be good for humans. And 7% of visitors gave responses that did not fit into any of these categories.

**Table 36: Science Café Participant Perceptions of The Main Idea**

| Response | Number of participants (n=101) | Percentage |
|---|---|---|
| The human microbiome in general | 35 | 35% |
| How to be healthy, human health | 23 | 23% |
| How the human body works | 19 | 19% |
| It was cool/fun/interesting | 6 | 6% |
| To educate | 6 | 6% |
| Microbes can be good for you | 5 | 5% |
| Miscellaneous | 7 | 7% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Note: For open-ended responses, direct quotes are provided in italics.

Over a third of participant (35%) thought the event's main idea was to teach about the **human microbiome in general**.

> *Human microbiome.*
>
> *Benefits/functions of the microbiome.*
>
> *Current state of knowledge of the significance of the biome.*

Some participants (23%) said the goal of the evening was to teach people **being healthy and how to maintain human health**.

*Our health is largely determined by the health of our microbiome.*

*Human microbiome is essential for good health.*

*Interaction of the human microbiome and health. Significant and interesting.*

Other Science Café participants (19%) believed the topic of the event was meant to show **how the human body works**.

*Bacteria, etc., in and on the body.*

*We are colonies of millions of critters.*

*The organisms that live in and on you are super important.*

A few participants (6%) mentioned that the event was **fun or cool or interesting**.

*Pretty cool*

*Very interesting.*

*Great!*

A few participants (6%) wrote that the main idea of the evening was to **educate the guests.**

*Educate about the microbiome.*

*To inform us about the human microbiome, a huge collection of microbes that helps people in various ways and is essential to us.*

*Education about our bodies!*

A small percentage (5%) said the main idea of the Science Café event was to show that **microbes could be good for humans**.

*Human microbiome is good overall.*

*Microbes are helpful to the body and can be used as medicine/therapeutic tools.*

*Bacteria are our friends!*

And 7% of visitors gave responses that did not fit into any of these categories.

*It's a good'n*

*Intriguing. Timely. Pertinent (wife has Crohn's).*

*We are not alone.*

Participants in the Science Café event were asked what they liked most about the event that evening (see **Table 37**). More than a third of participants (42%) wrote that they enjoyed the information or content presented during the evening, and some participants (15%) specifically called out the graphics or slides shown during the presentation. Some participants (16%) liked the general topic of the Science Café event. A few participants (9%) did not mention one specific part of the evening that they liked, but said they enjoyed everything, or that the evening was fun. A small percentage of participants made additional suggestions for improvements (3%), said they enjoyed the game of trivia (3%). And 15% of participants gave responses that did not fit into any of these categories.

**Table 37: What Participants Liked Most About Science Café**

| Response | Number of participants (n=91) | Percentage |
|---|---|---|
| Information or content from presentation | 38 | 42% |
| Topic of the talk | 15 | 16% |
| Graphics from presentation | 14 | 15% |
| Enjoyed everything/it was fun | 8 | 9% |
| Suggestions for improvements | 4 | 3% |
| Trivia | 4 | 3% |
| Miscellaneous | 14 | 15% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

More than a quarter of participants (42%) wrote that they enjoyed the **information or content presented** during the evening.

*The study about the lean verses obese mice was super interesting.*

*Right level of layman's viewpoint. Clear and informative. Well organized.*

*The talk is what I'm interested in studying so it was all fascinating to me. Especially the future uses in therapy.*

Some participants (15%) specifically called out **the graphics or slides shown** during the presentation.

> *Graphics. Also liked info on pro and pre biotic, on cholesterol, HM, and cancer treatment. Would have liked more detail and more on cutting edge info- what are we learning/studying right now? What are hot topics in the field? This talk can all be found on NYT articles. What is speaker an expert on? What does he work on and care about?*
>
> *The slides about how the microbiome protects us (with the diagram).*
>
> *Solid slide deck with good detail and visuals.*

Some participants (16%) liked the **general topic** of the Science Café event.

> *Great integrated summary of the whole topic!*
>
> *I love the topic!*
>
> *Relevance of topic.*

A few participants (9%) did not mention one specific part of the evening that they liked, but said they **enjoyed everything, or that the evening was fun**.

> *Nice event- fun way to get a lecture.*
>
> *The humor- great talk!*
>
> *Everything.*

A small percentage of participants (3%) made **additional suggestions for improvements**.

> *Terrible presentation. Superficial, poorly presented, and limited knowledge demonstrated in the Q & A.*
>
> *Poor speaker- just read his slides.*

A small percentage of participants (3%) said they enjoyed the **game of trivia**.

> *Trivia.*
>
> *Trivia was fun. Presentation was poor.*

And 15% of participants gave responses that did not fit into any of these categories.

*Learning.*

*Perseverance despite spilled beer.*

*Something every human should care about.*

*Having lots of people learning about this!*

The last question on the Science Café survey asked participants what they learned from the event, if anything. Participants in the Science Café study most often (47%) referenced learning something from a particular part of the presentation during the event (see **Table 38**). Science Café participants (29%) also reported learning what the human microbiome is, in general. For a few participants (12%) all of the information was new. A few participants (6%) said they already knew about the human microbiome. And 6% of visitors gave responses that did not fit into any of these categories.

**Table 38: What Participants Learned at Science Café**

| Response | Number of participants (n=85) | Percentage |
|---|---|---|
| Information specifically from presentation | 40 | 47% |
| About the human microbiome in general | 25 | 29% |
| Everything/ I didn't know any of this | 10 | 12% |
| I already knew a lot | 5 | 6% |
| Miscellaneous | 5 | 6% |

Participants in the Science Café study most often (47%) referenced learning something from a **particular part of the presentation** during the event.

*The microbiome varies widely by location in the body. I didn't know about microbiome transplant for cancer patients.*

*Transition of human microbiome through life changes.*

*Placental transmission of bacteria.*

*Microbiome and obesity- fascinating.*

*Fecal transplants are being made into pill form.*

Science Café participants (29%) also reported learning **what the human microbiome is**, in general.

> *I didn't know how diverse different parts of the body's microbes are.*
>
> *The microbiome- bacterial cells make up 10 times our human cells amount!*
>
> *I gained a better understanding of the microbiome.*

For a few participants (12%) **all of the information** was new.

> *Almost everything presented here was new to me.*
>
> *Knew almost nothing. Learned quite a bit, too much to list.*
>
> *Everything! Seriously, I didn't know anything.*

A few participants (6%) said they **already knew about the human microbiome**.

> *Most of the information I know already.*
>
> *I'm more knowledgeable than I thought. I now have proof for my doubting husband that pre and probiotics work. For real. So thanks!*
>
> *Not much.*

And 6% of participants gave responses that did not fit into any of these categories.

> *On your quiz slides, 18 ft does not equal 3 yards.*
>
> *Good: details of system.*
>
> *I thought the hygiene hypothesis had been disproven in terms of causing allergies. Or increasing likelihood of having.*

Science Café participants were asked to answer, on a scale from 1 to 7, with 1 being "strongly disagree" and 7 being "strongly agree," three questions that directly related to the goals of the *Zoo in You* project. Science Café attendees gave generally positive ratings in response to these questions (see **Table 39**). Interestingly, the ratings for these items were somewhat higher than those from the exhibition, ranging from 5.7 to 6.2. However, given the amount of time for the Science Café was much higher than time spent by general visitors in the exhibition, and was also facilitated rather than self-guided.

**Table 39: Ratings by Participants at Science Café**

| Tonight's science café… | Average | (Strongly disagree) 1 | 2 | 3 | 4 | 5 | 6 | (Strongly agree) 7 |
|---|---|---|---|---|---|---|---|---|
| Helped me learn about the microbes in my own body (n=104) | 5.8 | 1% | 1% | 6% | 8% | 17% | 33% | 35% |
| Increased my understanding of the interactions between my body, my microbes and my environment (n=104) | 5.7 | 1% | 1% | 5% | 13% | 16% | 32% | 33% |
| Made me want to learn more about what scientists are discovering about microbes and health (n=103) | 6.2 | 0% | 1% | 2% | 7% | 14% | 19% | 57% |

Note: Scale was from 1 (Strongly disagree) to 7 (Strongly agree)

OMSI's Science Café events typically start off with a ten-question trivia game which features questions relevant to the topic on which the speaker will be presenting. The questions are prepared in advance by the guest speaker, with some editing for style and clarity by OMSI staff beforehand. These trivia games serve to introduce some of the themes in advance of the talk and build anticipation and engagement in the audience, but they can also be seen as a way to informally gauge the audience members' prior knowledge on the subject. The numbers reported below did focus on the human microbiome, but the questions were based on the speaker and not the exhibition. On average, participants in Science Café scored 6.9 out of 10 on their human microbiome-focused trivia game. Below is a more detailed spread of scores from participants in the Science Café study (see **Table 40**). The majority of participants (77%) scored between 6 and 8 out of 10 points, while no participants scored below 4 out of 10 points.

**Table 40: Spread of Trivia Scores for Participants at Science Café**

| Score | Number of participants (n=136) | Percentage of Participants |
|---|---|---|
| 1 | 0 | 0% |
| 2 | 0 | 0% |
| 3 | 0 | 0% |
| 4 | 3 | 2% |
| 5 | 16 | 12% |
| 6 | 37 | 27% |
| 7 | 27 | 20% |
| 8 | 41 | 30% |
| 9 | 8 | 6% |
| 10 | 4 | 3% |

Note: The trivia was independent of and not related to the exhibition, and scores are included to be comprehensive in providing survey results. Also, in order to gather a larger number of responses, the survey was handed out at the beginning of the evening so it is possible that some participants previewed the questions before the program.

To gain some insight about the reach of OMSI publicity and advertising, participants in the Science Café study were asked how they heard about the Science Café event (see **Table 41**). Participants most often said (46%) they heard about the event through the OMSI mailing list. Over a quarter of participants (26%) wrote an answer in the "other" category. Some visitors learned about the event through the OMSI website (18%) or already knew about Science Café because they had attended previously (18%). And a small percentage of participants (10%) heard about Science Café through social media.

**Table 41: How Science Café Participants Heard About the Event**

| Response | Number of participants (n=124) | Percentage |
|---|---|---|
| Mailing list | 57 | 46% |
| Other | 32 | 26% |
| OMSI website | 22 | 18% |
| Attended previous event | 23 | 18% |
| Facebook or Twitter | 13 | 10% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

Participants who chose the "Other" category wrote in responses including:

*My mom's on the science pub mailing list*

*Friend* (cited by multiple individuals)

*Other website*

*My son went in Corvallis.*

*Sci-fi lit at PCC....*

*Science teacher*

*Friend who works at OMSI*

*My wife invited me.*

*Professor*

*OMSI volunteer newsletter*

*Meetup email*

*Husband and his nerd tendencies*

Participants in the Science Café event were asked to suggest improvements for the Science Café event (see **Table 42**). The most common suggestions from participants (28%) were in regards to the presentation. Some participants (23%) wrote about improvements for the event's speaker, and a few participants (14%) suggested changes to the location of Science Café events. And 38% of participants made suggestions that did not fit into any of these categories. It should be noted that a number of these responses were in reference to a minor mishap involving a glass of beer and the computer on which the presentation was being shown.

**Table 42: Suggestions To Improve Science Café**

| Response | Number of participants (n=70) | Percentage |
|---|---|---|
| Presentation | 20 | 28% |
| Speaker | 16 | 23% |
| Location of event | 10 | 14% |
| Miscellaneous | 27 | 38% |

Note: Visitors could provide more than one response to this item so the column percentages total more than 100%

The most common suggestions from participants (28%) were in regards to the **presentation**.

> *It would be cool to see more evidence/current research that's behind these facts.*
>
> *Slides shouldn't have more than 15 words. Keep momentum. Preview speakers for rapport/charisma. Adapt to a lay audience. Guidelines for image resolution- Hernan's were too blurry.*
>
> *This one was clear, extremely interesting. No sales people like guy a few months ago selling DNA testing.*
>
> *The projector was a little out of focus. The pace was also a little slow.*
>
> *Perhaps less time for questions- the audience is less interesting than the speaker.*

Some participants (23%) wrote about improvements for the **event's speaker**.

> *Better speaker. The presenter was very dry and appeared to be reading the information off the powerpoint slides most of the time. A great topic needs a decent public speaker to be well received.*
>
> *Speaker was difficult to understand due to his accent.*
>
> *Invite someone from MIT's media lab to talk about big data and vetting data sets.*
>
> *Make sure speaker knows how to explain science vocab to audience and make science more fun!*
>
> *You need to pre-qualify the speakers- this one had way too thick of an accent; also he is a poor quality public speaker, even aside from the accent and language barrier.*

A few participants (14%) suggested changes to **the location** of Science Café events.

> *Change the seats- these are awful. The cup holders cut into my arms and kept sliding out of the chair.*
>
> *Go back to the Bagdad Theater or Mission Theater.*
>
> *More servers at the bar in theory.*
>
> *Larger venue?*

And 38% of participants made suggestions that did not fit into any of these categories.

> *Don't spill beer on the computer.*
>
> *Have them more often! And repeat popular talks.*
>
> *Give ideas to address climate change. Have topics focused on climate change and slides with questions on climate change before the talk.*
>
> *Doing a great job, keep it up.*
>
> *A warning for when it's about to start (5-10 mins before) for a bathroom break, last food call, etc.*

## References

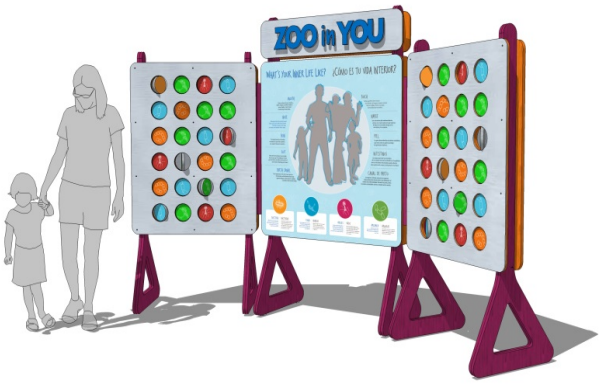
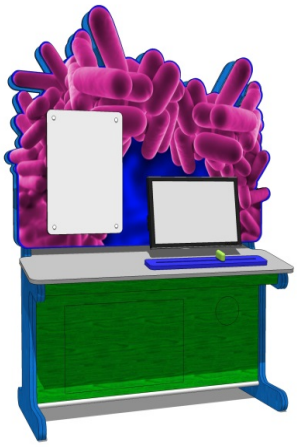
Bilingual Design Guide. (2016, April 18). Retrieved from http://www.nisenet.org/catalog/tools_guides/bilingual_design_guide

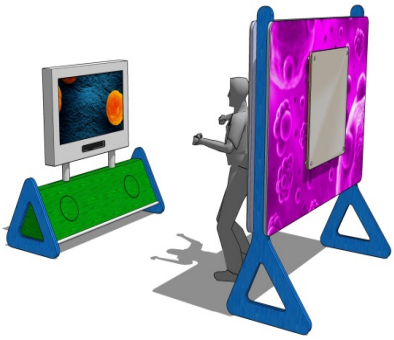
Rounds, J. (2004). Strategies for the curiosity-driven museum visitor. Curator: The Museum Journal, 47 (4), 389-412.

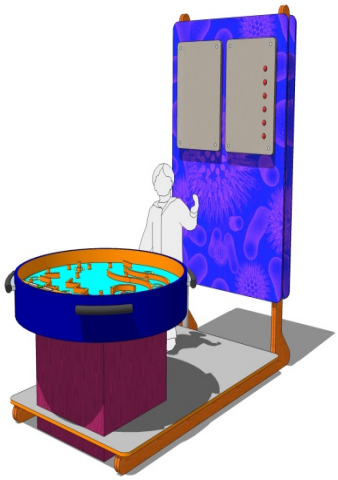
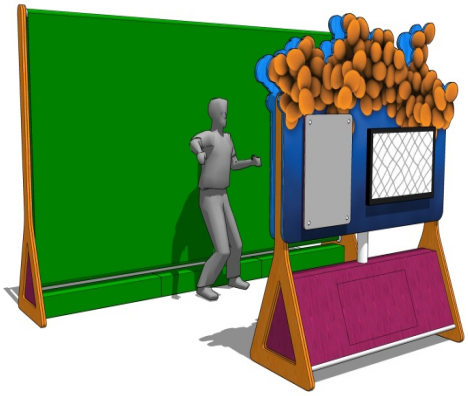
Renner, N., Garibay, C., Yalowitz, S. S., & Plaza, C. (2015). Bilingual Exhibits: Current Practices, Collective Knowledge, Outstanding Questions. Journal of Museums & Social Issues, 10 (1), 66-82.

Yalowitz, S. S., Garibay, C., Renner, N., & Plaza, C. (2015). Bilingual Spanish-English Intergenerational Groups' Experiences in Bilingual Exhibitions. Journal of Museums & Social Issues, 10 (1), 35-51.

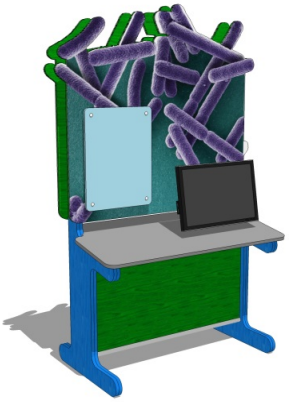
## Appendix A: Titles and descriptions of exhibit elements in the *Zoo in You* exhibition

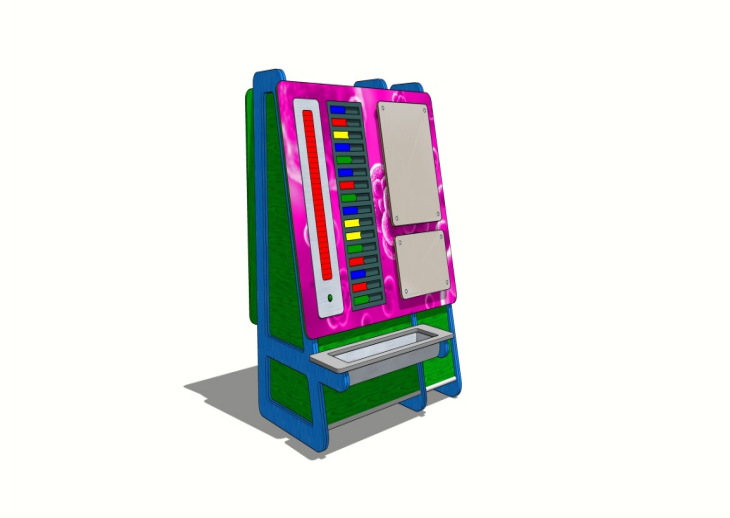
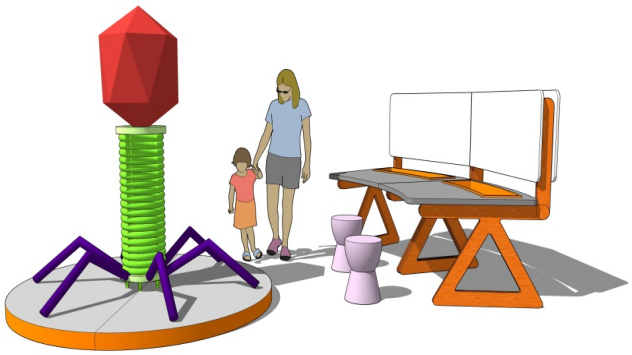
| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **Meet the Microbes** | ***What's Your Inner Life Like?*** Spin small colorful microbe disks to reveal the four major types of microbes (bacteria, archaea, fungi and viruses) and where they live inside you!<br>  |
| **How Tiny** | ***How Tiny Are Your Microbes?*** Zoom down to the microbe level and explore how much smaller our microbe companions are than our human cells.<br>  |

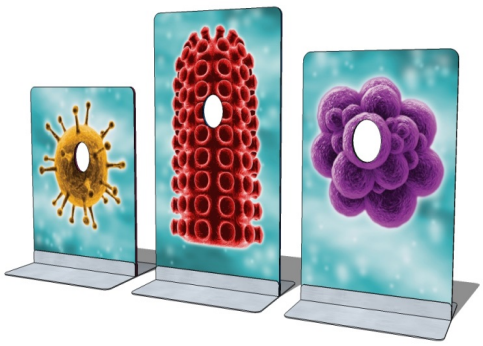
| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **MVP Puzzle** | ***Could You Survive Without Your Microbes?*** Insert puzzle pieces into a silhouette of the human body and learn about our "good" microbes.  |
| **Microbe Mirror** | ***Are You More Than Human?*** Watch your microbiome react to everyday occurrences in this full-body Kinects-style game.  |

| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **Marble Maze** | ***Where Did Your Microbiome Come From?*** Manipulate a tilt table maze to learn how a newborn baby is first colonized by microbes.<br>  |
| **Weather Report** | ***How's The Weather Inside Your Body?*** Interact with green screen technology to give a "weather report" on the climate conditions of your nose, mouth, gut or skin.<br>  |

| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **Microbes in Balance** | ***How Do Your Microbes Protect You?*** See if you can keep your gut microbes in balance in this touch-screen video game.<br>  |
| **Hand Washing** | ***How Should You Wash Your Hands?*** "Wash" your hands and observe how long it takes to be free of germs.<br>  |

| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **Stories and Choices** | ***What Would You Do?*** Would you donate your poop to science? Vote on various scenarios and see if most people agree or disagree with your choice.  |
| **Under the Lens** | ***What Do Your Microbes Look Like?*** Peer into a microscope and examine real preserved microbe specimens.  |

| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **DNA Puzzle** | ***What Is Your DNA Puzzle?*** Race against the clock to see how fast you can assemble a DNA strand.<br>  |
| **Bacteriophage Sculpture** and **Build a Phage** | ***Do All Viruses Make You Sick?*** Build your own three-dimensional virus and see if it matches the gigantic bacteriophage virus towering nearby.<br>  |

| Working title, as used in summative report | Header of exhibit sign and brief description of activity with illustration |
|---|---|
| **Photo Opportunity** | ***What Would You Look Like?*** Take a picture of you, your family and friends, all as giant microbes.  |

# Appendix B: General Visitor instruments, OMSI

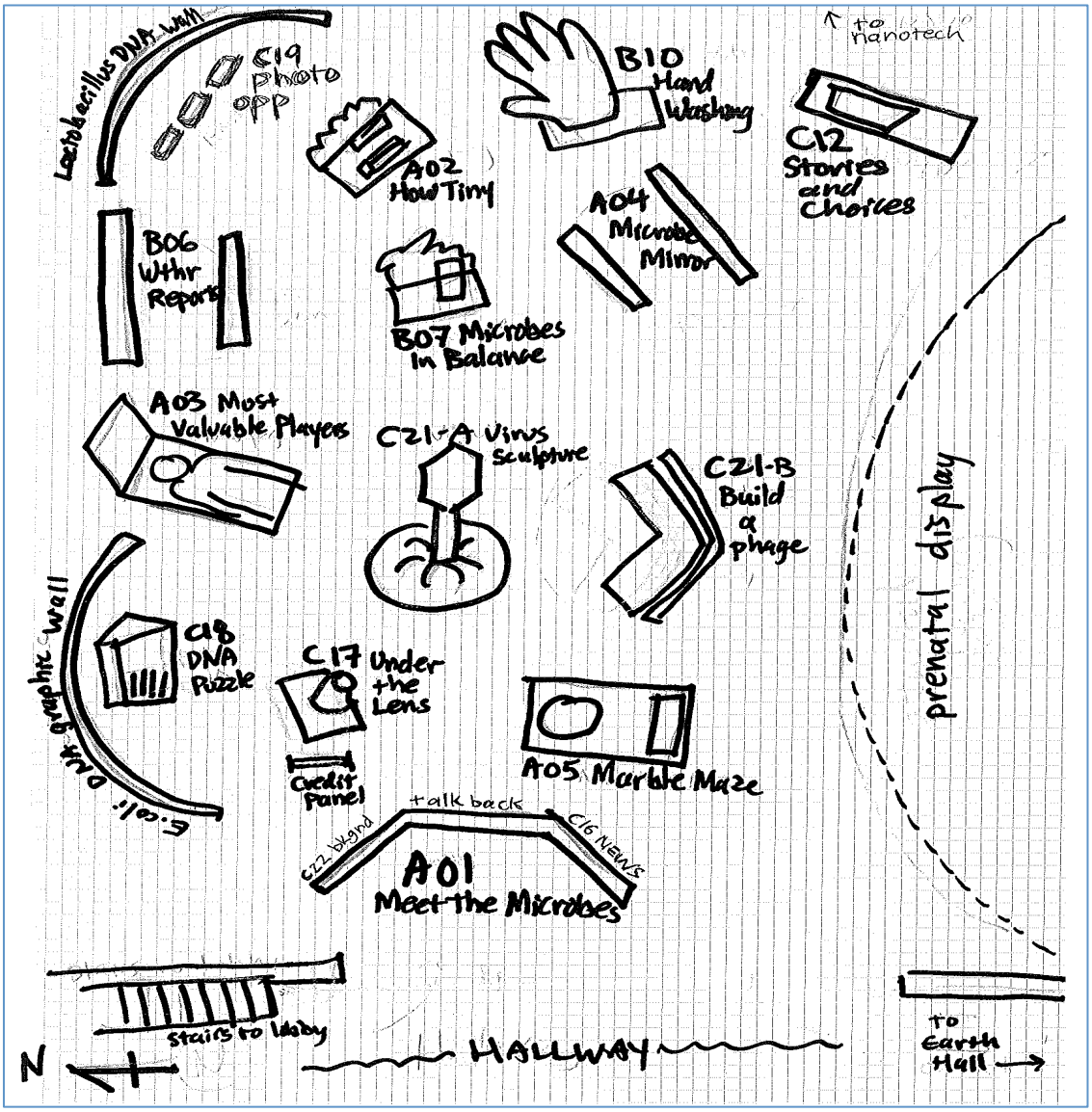
## Zoo in You Interview

**[Only recruit groups with at least one child age 8 to 18]**

Hello, my name is ___ and I'm working with [OMSI /ScienceWorks] to get some feedback about the visit. Today we're talking to people about the *Zoo in You* exhibit and we were hoping you could help us out today by visiting it and then answering some questions. It doesn't add very much time at all to your visit – would you be willing to help us out?

[If NO] Okay, thanks very much and enjoy the rest of your visit.

[If YES] Great, the *Zoo in You* exhibit includes the exhibit areas right here [indicate boundaries of *Zoo in You*]. Just go through it like you normally would – we'll be here taking a couple notes while you go through, and then let us know when you're done so we can ask you some questions.




Total time: _____ **H=Hands on/interactive**

## YOUR VISIT TODAY

1) **Please complete this sentence about your visit to the *Zoo in You* exhibit: "I never realized that…"**

_____

2) **What do you think this exhibit is about? What is the main idea it's trying to communicate?**

_____

3) **One of the main ideas about the exhibit is *"Our bodies are a complex ecosystem that we are just beginning to explore."* Which parts of the exhibit did a good job communicating this?**

_____

4) **Were there any areas in *Zoo in You* that worked particularly well for your whole group?**

□ **Yes** □ **No**

**4a. If yes, where?** _____

5) **The exhibit used the term "human microbiome." Did you see, hear or read this anywhere in the exhibit?**

□ **Yes** □ **No**

**5a. If yes, what stood out most for you about this topic?** _____

6) **Did the exhibit being in both Spanish and English enhance, detract from, or make no difference for your experience in *Zoo in You*?**

□ **Enhance** □ **Detract from** □ **Make no difference**

**6a. Why do you say that?** _____

**These questions are easier for you to fill out on your own.**

**7) To what extent do you agree with the following statements. Visiting *Zoo in You*…**

**7a. Helped me learn about the microbes in my own body.**

1 2 3 4 5 6 7
Strongly Disagree Strongly Agree

**7b. Increased my understanding of the interactions between my body, my microbes, and my environment.**

1 2 3 4 5 6 7
Strongly Disagree Strongly Agree

**7b. Made me want to learn more about what scientists are discovering about microbes and health.**

1 2 3 4 5 6 7
Strongly Disagree Strongly Agree

**NOW JUST A FEW QUESTIONS ABOUT YOU**

**1) Is this your first visit to OMSI? □ Yes □ No**

**2) Are you currently a member of OMSI? □ Yes □ No**

**3) How likely are you to visit OMSI again?**

1 2 3 4 5 6 7
Not at all Very likely

**4) What is your gender? □ Male □ Female**

**5) Which of the following best describes your ethnic origin (check all that apply)**

**□ American Indian/Alaskan Native**
**□ Asian**
**□ Native Hawaiian/Other Pacific Islander**
**□ White**
**□ Black or African-American**
**□ Other: _____**

**6) Are you of Hispanic, Latino or Spanish origin? □ Yes □ No**

**7) Which city and state do you live in (or city and country if from outside United States)? _____**

**8) What language(s) do you regularly speak at home? _____**

**9) What year were you born? _____**

**10) What are the ages of the other people in your group today?**

**____ ____ ____ ____ ____ ____ ____ ____**

**Thank you very much for your time and feedback, it is much appreciated!**

**Spanish version of General Visitor Instrument, OMSI:**

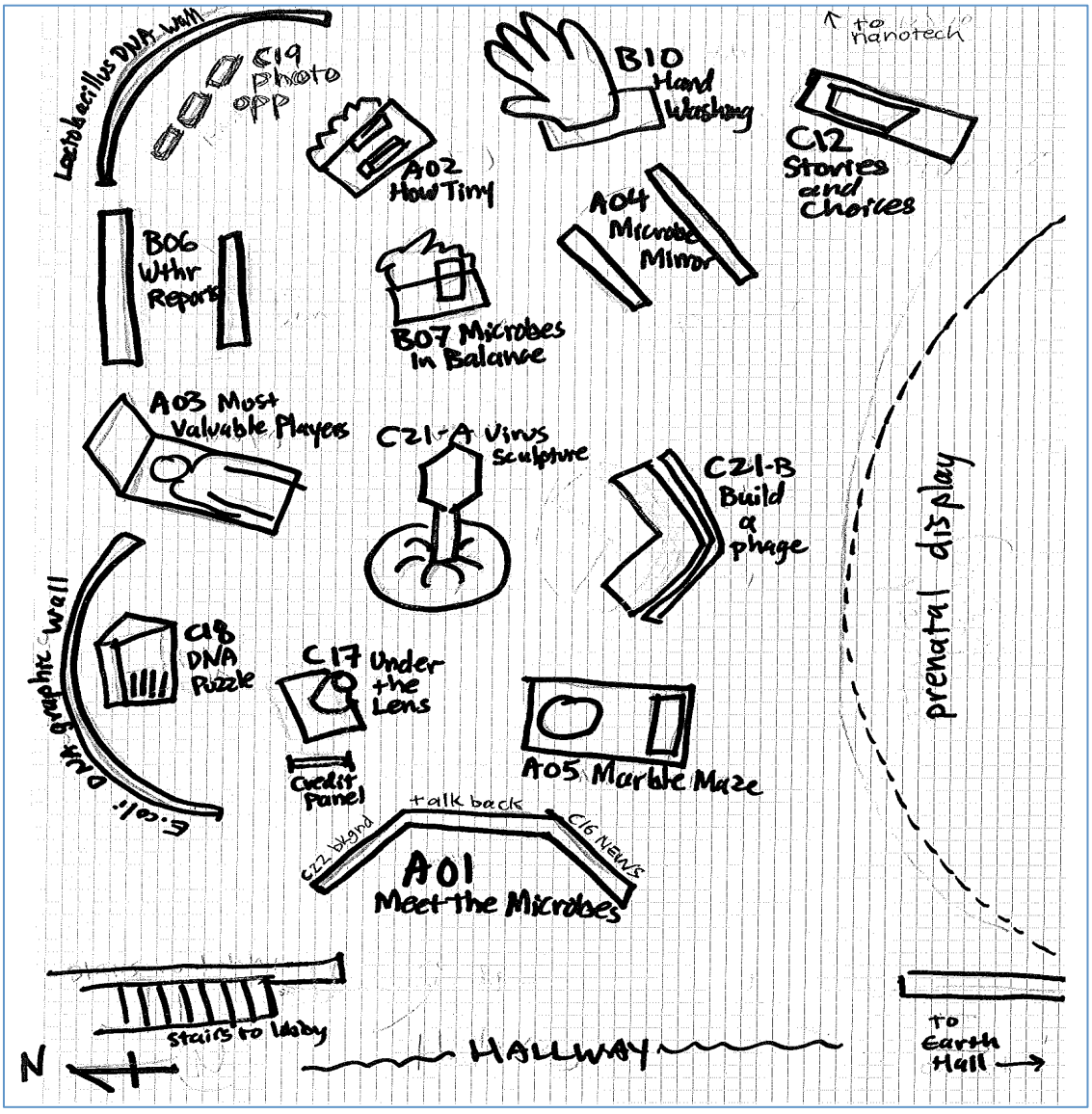
## Zoo in You Interview

**[Only recruit groups with at least one child age 8 to 18]**

Hola, me llamo ____ y estoy colaborando con [OMSI /ScienceWorks] para obtener sus opiniones acerca de su visita. Hoy estamos hablando con la gente acerca de la exhibición *Zoo in You* y nos gustaría saber podría visitar la exhibición y luego responder algunas preguntas. No le quita casi ningún tiempo de su visita. ¿Estaría dispuesto(a) a ayudarnos?

[If NO] Está bien, muchas gracias y que disfrute del resto de su vista.

[If YES] Perfecto, la exhibición *Zoo in You* incluye las áreas de exhibición aquí [indicate boundaries of *Zoo in You*]. Visítela como lo haría normalmente; estaremos aquí tomando algunos apuntes mientras la explora y luego indíquenos cuando termine para poder hacerle unas preguntas.




Total time: _____ **H=Hands on/interactive**

## YOUR VISIT TODAY

1) **Complete la siguiente oración acerca de su visita a la exhibición *Zoo in You*: "No tenía idea de que..."**

_____

2) **¿De qué piensa que se trata esta exhibición? ¿Cuál es la idea principal que intenta comunicar?**

_____

3) **Una de las ideas principales de la exhibición es que *"nuestro cuerpo es un ecosistema complejo que estamos apenas comenzando a explorar."* ¿Qué partes de la exhibición comunicaron bien este mensaje?**

_____

4) **¿Hubo algún área de la exhibición *Zoo in You* que tuvo un efecto particularmente positivo en todo su grupo?**

□ **Sí** □ **No**

**4a. Si la respuesta es afirmativa, ¿dónde?** _____

5) **En la exhibición se usó el término "microbioma humano." ¿Vio, escuchó o leyó esto en alguna parte de la exhibición?**

□ **Sí** □ **No**

**5a. Si la respuesta es afirmativa, ¿qué fue lo que más le llamó la atención sobre este tema?** _____

6) **¿El hecho de que la exhibición se ofreciera en inglés y español mejoró, le empeoró o no tuvo ningún efecto en su experiencia con la exhibición *Zoo in You*?**

□ **Mejoró** □ **Empeoró** □ **No tuvo ningún efecto**

**6a. ¿Por qué?** _____

**Estas preguntas son más fáciles de contestar por su cuenta.**

**8) ¿En qué medida está de acuerdo con las siguientes afirmaciones? Durante su visita a *Zoo in You*...**

**7a. Me ayudó a aprender sobre los microbios en mi propio cuerpo.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**7b. Mejoró mi conocimiento de la interacción entre mi cuerpo, mis microbios y mi entorno.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**7b. Hizo que quisiera aprender más sobre lo que los científicos están descubriendo sobre los microbios y la salud.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**AHORA LE HAREMOS ALGUNAS PREGUNTAS SOBRE USTED**

**9) ¿Es su primera visita a la OMSI? ☐ Sí ☐ No**

**10) ¿Es usted actualmente miembro de la OMSI? ☐ Sí ☐ No**

**11) ¿Cuán probable es que vuelva a visitar la OMSI?**

1 2 3 4 5 6 7

Nada Muy probable

**12) ¿Cuál es su sexo? ☐ Hombre ☐ Mujer**

**13) ¿Cuál de las siguientes describe mejor su origen étnico (marque todas las que correspondan)?**

**☐ Amerindio/Nativo de Alaska**
**☐ Asiático**
**☐ Nativo de Hawái/otra isla del Pacífico**
**☐ Blanco**
**☐ Negro o afroamericano**
**☐ Otro: _____**

**14) ¿Es de origen hispano, latino o español? ☐ Sí ☐ No**

**15) ¿En cuál ciudad o estado vive (o ciudad y país si vive fuera de Estados Unidos)?**

**16) ¿Qué idioma(s) habla regularmente en casa? _____**

**17) ¿En qué año nació? _____**

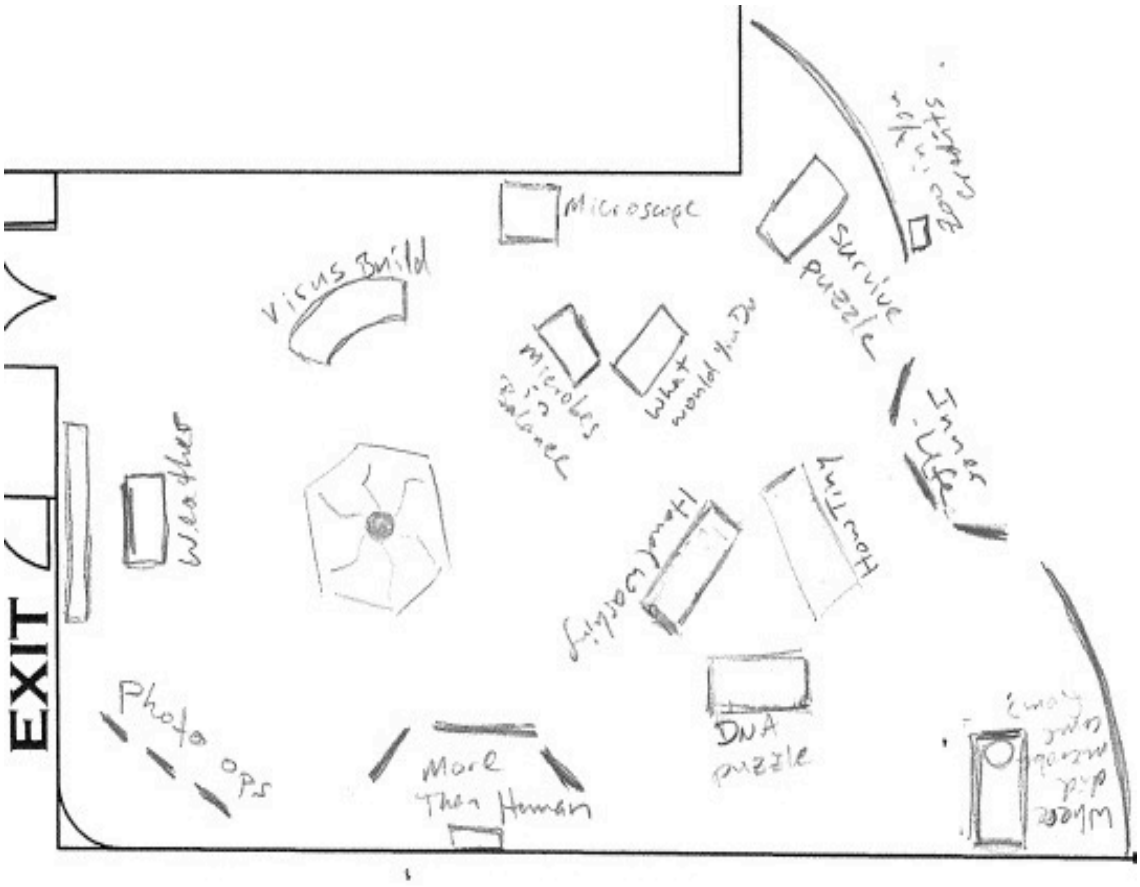
**18) ¿Qué edades tienen las demás personas que estaban en su grupo hoy?**

_____ _____ _____ _____ _____ _____ _____ _____

**¡Muchas gracias! Apreciamos su tiempo y sus respuestas.**

## Appendix C: General Visitor instruments, ScienceWorks

**[Only recruit groups with at least one child age 8 to 18]** Hello, my name is ___ and I'm working with [OMSI /ScienceWorks] to get some feedback about the visit. Today we're talking to people about the *Zoo in You* exhibit and we were hoping you could help us out today by visiting it and then answering some questions. It doesn't add very much time at all to your visit – would you be willing to help us out?
[If NO] Okay, thanks very much and enjoy the rest of your visit.
[If YES] Great, the *Zoo in You* exhibit includes the exhibit areas right here [indicate boundaries of *Zoo in You*]. Just go through it like you normally would – we'll be here taking a couple notes while you go through, and then let us know when you're done so we can ask you some questions.




Total time: _____ **H=Hands on/interactive**

## YOUR VISIT TODAY

1) **Please complete this sentence about your visit to the *Zoo in You* exhibit: "I never realized that…"**

   _____

2) **What do you think this exhibit is about? What is the main idea it's trying to communicate?**

   _____

3) **One of the main ideas about the exhibit is *"Our bodies are a complex ecosystem that we are just beginning to explore."* Which parts of the exhibit did a good job communicating this?**

   _____

4) **Were there any areas in *Zoo in You* that worked particularly well for your whole group?**

   **□ Yes □ No**

   **4a. If yes, where? _____**

5) **The exhibit used the term "human microbiome." Did you see, hear or read this anywhere in the exhibit?**

   **□ Yes □ No**

   **5a. If yes, what stood out most for you about this topic? _____**

6) **Did the exhibit being in both Spanish and English enhance, detract from, or make no difference for your experience in *Zoo in You*?**

   **□ Enhance □ Detract from □ Make no difference**

   **6a. Why do you say that? _____**

**These questions are easier for you to fill out on your own.**

**7) To what extent do you agree with the following statements. Visiting *Zoo in You*…**

**7a. Helped me learn about the microbes in my own body.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**7b. Increased my understanding of the interactions between my body, my microbes, and my environment.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**7b. Made me want to learn more about what scientists are discovering about microbes and health.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**NOW JUST A FEW QUESTIONS ABOUT YOU**

**1) Is this your first visit to ScienceWorks? □ Yes □ No**

**2) Are you currently a member of ScienceWorks? □ Yes □ No**

**3) How likely are you to visit ScienceWorks again?**

1 2 3 4 5 6 7

Not at all Very likely

**4) What is your gender? □ Male □ Female**

**5) Which of the following best describes your ethnic origin (check all that apply)**

**□ American Indian/Alaskan Native**
**□ Asian**
**□ Native Hawaiian/Other Pacific Islander**
**□ White**
**□ Black or African-American**
**□ Other: _____**

**6) Are you of Hispanic, Latino or Spanish origin? □ Yes □ No**

**7) Which city and state do you live in (or city and country if from outside United States)? _____**

**8) What language(s) do you regularly speak at home? _____**

**9) What year were you born? _____**

**10) What are the ages of the other people in your group today?**

_____ _____ _____ _____ _____ _____ _____ _____

**Thank you very much for your time and feedback, it is much appreciated!**

**Spanish version of General Visitor Instrument, ScienceWorks:**

## NOTE: While this Spanish version of the instrument was available, no one chose to complete it in Spanish at Science Works.

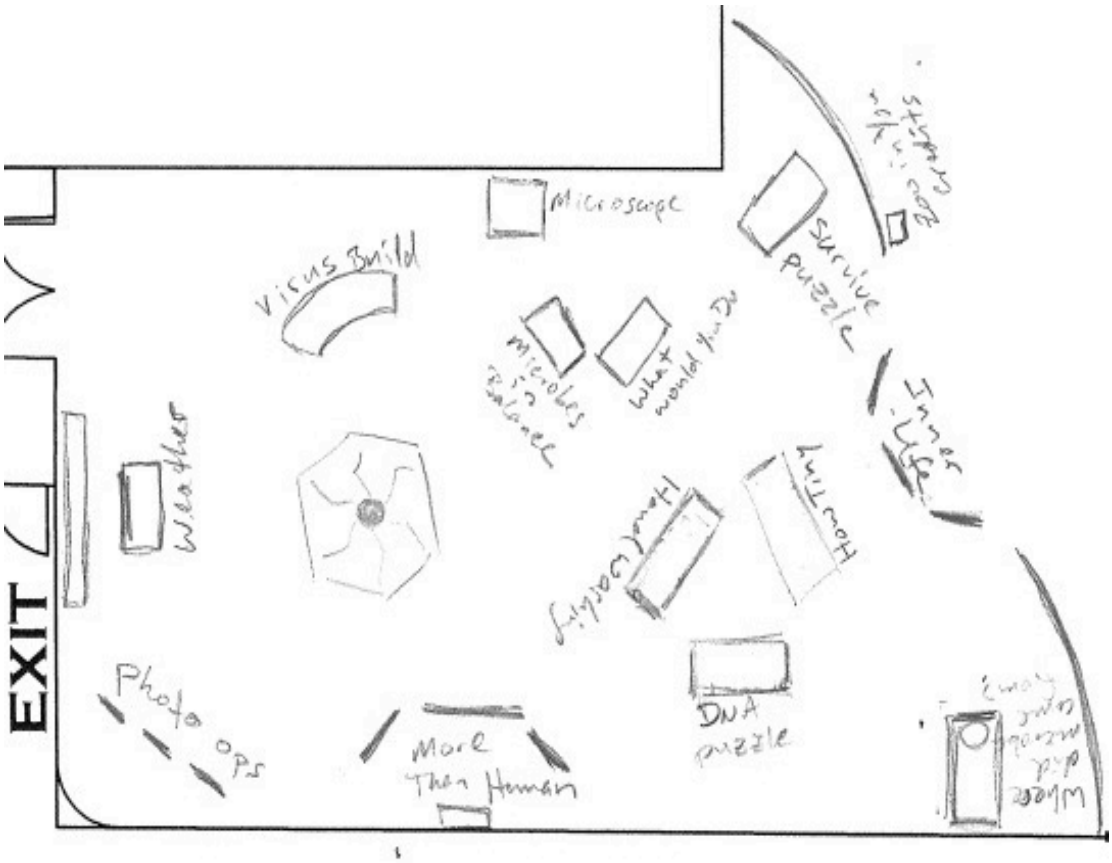
### *Zoo in You* Interview

**[Only recruit groups with at least one child age 8 to 18]**

Hola, me llamo ____ y estoy colaborando con [OMSI /ScienceWorks] para obtener sus opiniones acerca de su visita. Hoy estamos hablando con la gente acerca de la exhibición *Zoo in You* y nos gustaría saber podría visitar la exhibición y luego responder algunas preguntas. No le quita casi ningún tiempo de su visita. ¿Estaría dispuesto(a) a ayudarnos?

[If NO] Está bien, muchas gracias y que disfrute del resto de su vista.

[If YES] Perfecto, la exhibición *Zoo in You* incluye las áreas de exhibición aquí [indicate boundaries of *Zoo in You*]. Visítela como lo haría normalmente; estaremos aquí tomando algunos apuntes mientras la explora y luego indíquenos cuando termine para poder hacerle unas preguntas.




Total time: _____ **H=Hands on/interactive**

## YOUR VISIT TODAY

1) **Complete la siguiente oración acerca de su visita a la exhibición *Zoo in You*: "No tenía idea de que..."**

_____

2) **¿De qué piensa que se trata esta exhibición? ¿Cuál es la idea principal que intenta comunicar?**

_____

3) **Una de las ideas principales de la exhibición es que *"nuestro cuerpo es un ecosistema complejo que estamos apenas comenzando a explorar."* ¿Qué partes de la exhibición comunicaron bien este mensaje?**

_____

4) **¿Hubo algún área de la exhibición *Zoo in You* que tuvo un efecto particularmente positivo en todo su grupo?**

□ **Sí** □ **No**

**4a. Si la respuesta es afirmativa, ¿dónde?** _____

5) **En la exhibición se usó el término "microbioma humano." ¿Vio, escuchó o leyó esto en alguna parte de la exhibición?**

□ **Sí** □ **No**

**5a. Si la respuesta es afirmativa, ¿qué fue lo que más le llamó la atención sobre este tema?** _____

6) **¿El hecho de que la exhibición se ofreciera en inglés y español mejoró, le empeoró o no tuvo ningún efecto en su experiencia con la exhibición *Zoo in You*?**

□ **Mejoró** □ **Empeoró** □ **No tuvo ningún efecto**

**6a. ¿Por qué?** _____

**Estas preguntas son más fáciles de contestar por su cuenta.**

**19) ¿En qué medida está de acuerdo con las siguientes afirmaciones? Durante su visita a *Zoo in You*...**

**7a. Me ayudó a aprender sobre los microbios en mi propio cuerpo.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**7b. Mejoró mi conocimiento de la interacción entre mi cuerpo, mis microbios y mi entorno.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**7b. Hizo que quisiera aprender más sobre lo que los científicos están descubriendo sobre los microbios y la salud.**

1 2 3 4 5 6 7

Para nada de acuerdo Muy de acuerdo

**AHORA LE HAREMOS ALGUNAS PREGUNTAS SOBRE USTED**

**20) ¿Es su primera visita a la ScienceWorks? ☐ Sí ☐ No**

**21) ¿Es usted actualmente miembro de la ScienceWorks? ☐ Sí ☐ No**

**22) ¿Cuán probable es que vuelva a visitar la ScienceWorks?**

1 2 3 4 5 6 7

Nada Muy probable

**23) ¿Cuál es su sexo? ☐ Hombre ☐ Mujer**

**24) ¿Cuál de las siguientes describe mejor su origen étnico (marque todas las que correspondan)?**

**☐ Amerindio/Nativo de Alaska**
**☐ Asiático**
**☐ Nativo de Hawái/otra isla del Pacífico**
**☐ Blanco**
**☐ Negro o afroamericano**
**☐ Otro: _____**

**25) ¿Es de origen hispano, latino o español? ☐ Sí ☐ No**

**26) ¿En cuál ciudad o estado vive (o ciudad y país si vive fuera de Estados Unidos)?**

**27) ¿Qué idioma(s) habla regularmente en casa? _____**

**28) ¿En qué año nació? _____**

**29) ¿Qué edades tienen las demás personas que estaban en su grupo hoy?**

_____ _____ _____ _____ _____ _____ _____ _____

**¡Muchas gracias! Apreciamos**

## Appendix D: Family Science Night instrument

### Noche de ciencia *Zoo in You*

Por favor responda las siguientes preguntas acerca de su visita a *Zoo in You*. La encuesta es anónima, así que puede responder con la mayor honestidad. Muchas gracias por sus comentarios.

### SU VISITA DE HOY

1) **¿De qué piensa que se trata esta exhibición? ¿Cuál es la idea principal que se intenta comunicar?**

   _____

2) **En la exhibición se usó el término "microbioma humano." ¿Usted vio este término en alguna parte de la exhibición?**

   **□ Sí □ No**

   **2a. Si la respuesta es afirmativa, ¿qué fue lo que más le llamó la atención sobre este tema? _____**

3) **¿El hecho de que la exhibición se ofreciera en inglés y español: mejoró, empeoró, o no tuvo ningún efecto en su experiencia con la exhibición *Zoo in You*?**

   **□ Mejoró □ Empeoró □ No tuvo ningún efecto**

   **3a. ¿Por qué? _____**

4) **Esta exhibición fuera ofrecida en español, ¿ha cambiado su opinión acerca del OMSI?**

   **□ Sí □ No**

   **4a. ¿Por qué? _____**

**5) La exhibición *Zoo in You* es ofrecida en inglés y español; ¿que efecto tuvo esto en:**

**5a. Su interacción con las distintas partes de la exhibición.**

1 2 3 4 5 6 7
Nada Mucho

**5b. Su capacidad de entender el contenido de la exhibición.**

1 2 3 4 5 6 7
Nada Mucho

**5b. Su interacción con otras personas de su grupo.**

1 2 3 4 5 6 7
Nada Mucho

**AHORA LE HAREMOS ALGUNAS PREGUNTAS SOBRE USTED**

**6) ¿Es esta su primera visita al OMSI? ☐ Sí ☐ No**

**7) ¿Es usted actualmente miembro del OMSI? ☐ Sí ☐ No**

**8) ¿Qué tan probable es que vuelva a visitar el OMSI?**

1 2 3 4 5 6 7
No probable Muy probable

**9) ¿Cuál es su género ? ☐ Masculino ☐ Femenino ☐ Otro**

**10) ¿Cuál de las siguientes describe mejor su origen étnico? (Marque todas las que correspondan.)**

**☐ Indio de Estados Unidos/Nativo de Alaska**
**☐ Asiático**
**☐ Nativo de Hawái/otra isla del Pacífico**
**☐ Blanco**
**☐ Negro o afro Americano**
**☐ Otro: _____**

**11) ¿Es de origen hispano, latino o español? ☐ Sí ☐ No**

**12) ¿En qué ciudad o estado vive (o ciudad y país si vive fuera de Estados Unidos)?**

**_____**

**13) ¿Qué idioma(s) habla regularmente en casa? _____**

**14) ¿En qué año nació? _____**

**15) ¿Qué edades tienen las demás personas que están en su grupo hoy?**

**____ ____ ____ ____ ____ ____ ____ ____**

**¡Muchas gracias! Apreciamos su tiempo y sus respuestas.**

## Appendix E: Science Café instrument

**Trivia answers!**

| |
|---|
| *1* |
| *2* |
| *3* |
| *4* |
| *5* |
| *6* |
| *7* |
| *8* |
| *9* |
| *10* |


### OMSI Science Pub Evaluation

- **What do you think the main idea of tonight's Science Pub is?**
- **What did you like most at tonight's Science Pub?**
- **How could we improve the next Science Pub?**
- **What, if anything, have you learned here that you didn't know before?**
- **To what extent do you agree with the following statements. Tonight's Science Pub…**

**Helped me learn about the microbes in my own body.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**Increased my understanding of the interactions between my body, my microbes, and my environment.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**Made me want to learn more about what scientists are discovering about microbes and health.**

1 2 3 4 5 6 7

Strongly Disagree Strongly Agree

**OVER**

- **How did you hear about this event?**

  ❑ I'm on the Science Pub mailing list

  ❑ OMSI website ❑ Attended a Previous Science Pub event ❑ Facebook or Twitter

  ❑ Other _____

- **Have you been to OMSI in the past 12 months?** ❑ Yes ❑ No

- **Have you been to Science Pub before?** ❑ Yes ❑ No
  If so, how many times? _____

- **Are you currently a member of OMSI?** ☐ **Yes** ☐ **No**

- **Which of the following best describes your ethnic origin (check all that apply)**
  ❑ American Indian/Alaskan Native ❑ Asian
  ❑ Native Hawaiian/Other Pacific Islander ❑ White
  ❑ Black or African-American ❑ Other: _____

- **Are you of Hispanic, Latino or Spanish origin?** □ **Yes** □ **No**

- **What year were you born? _____**

- **What is your gender? _____**

- **Zip Code: _____**

**Sign up for the OMSI Science Pub email list!**

**Email:**_____
OMSI will not sell or distribute your email address

***Thank you!***