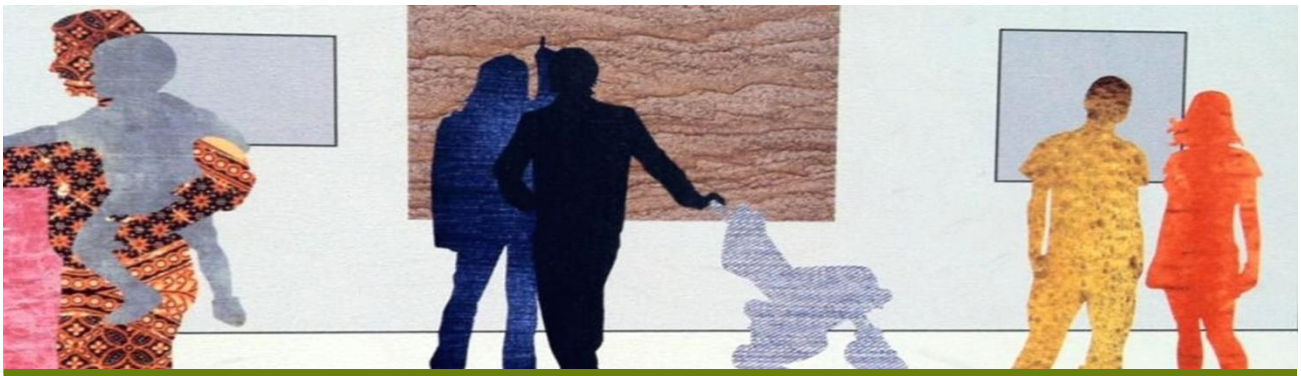

Sustainability: Exhibition Summative Evaluation Report

Community Environmental Services in Partnership with OMSI

clever together
juntos somos ingeniosos

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Table of Contents

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Executive Summary

Overview of the *Sustainability* Project

As part of the National Science Foundation funded *Sustainability: Promoting Sustainable Decision Making in Informal Education* project, the Oregon Museum of Science and Industry (OMSI) and its partners developed a bilingual (Spanish/English) exhibition, event series, outreach campaign including a public website, and a professional development website and workshop . The goal of these deliverables was to promote sustainable decision making by building skills that allow participants to weigh the tradeoffs of their choices and thereby choose more sustainable practices. The project duration was September 2009–April 2015. Portland State University (PSU), in collaboration with OMSI, supported many phases of evaluation during the project and led all summative evaluation activities.

Overview of *Clever Together/Juntos somos ingeniosos*

Clever Together/Juntos somos ingeniosos is:

- A 1,500 square foot permanent, bilingual (English/Spanish) exhibition at OMSI that promotes sustainable decision making by enabling visitors to build skills, weigh tradeoffs of their choices, and to feel comfortable choosing more sustainable practices.
- A hands-on approach to sustainability that focuses on environmental, economic, and social considerations: the three pillars of sustainability as defined by the United Nations.
- An experience designed specifically to focus on everyday choices regarding food, transportation, consumption, and energy in the Portland metro region.

The exhibition includes eight individual components designed to deliver the impacts outlined below as well as to communicate the project's big idea: We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.

The summative study evaluated the exhibition's achievement of the following impacts:
1. Participants will understand skills associated with sustainable decision making in their everyday lives.
2. **Participants will be encouraged to engage in more sustainable practices in the following categories: Transportation, Energy Conservation, Consumption & Waste, and Food.**

Key Results

The findings are based on surveys conducted within the *Clever Together/Juntos somos ingeniosos* exhibition. Family groups of one adult parent/caregiver and one child aged 10–17 were recruited for participation. Family groups included 30 English-speaking families (Group 1) and 21 Spanish-speaking families (Group 2). Responses are reported as family group responses, not individual participant feedback. Findings are organized by participant group, but not for comparative purposes. Comparison between the two groups was not a goal of the evaluation and is not encouraged. The targeted outcomes – or measures of success – were influential in the design of the questions, but the results did not always provide direct indications of whether or not outcomes were achieved. Rather, the success of some outcomes was inferred indirectly based on the results, and sometimes from more than one question. Rich data, when available, were used to gain significant insights into participant attitudes and understandings beyond the intended outcomes, but on occasion data were not substantive enough to yield deeper insights. Yet the findings demonstrate that, overall, the project successfully achieved the intended outcomes and impacts.

Impact Summary Table

Impact 1 Outcome Indicators	Evidence of Outcome (Measure of Success)
1. Over 70% of participants will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*	100% of Group 1 and Group 2 families captured the big idea, as indicated by responses that identified the impacts of at least one of the three pillars of sustainability. The environmental pillar was mentioned most frequently, by 69% of Group 1 and 62% of Group 2 families. All families in both groups demonstrated at least a basic understanding of the big idea when asked what factors to consider when making choices. 90% of Group 1 and 96% of Group 2 reported their choices can have a medium or large impact on their community.
2. 50% of participants will understand skills that support sustainable decision-making abilities.	87% of Group 1 and 100% of Group 2 families identified ways to contribute to a sustainable community. Responses reflected an understanding of skills that support sustainable decision-making abilities. The most common content areas mentioned were Energy Conservation and Waste & Consumption.
3. Over 60% of participants will identify available options to make more sustainable decisions.	87% of Group 1 and 100% of Group 2 families were able to identify available options.

Impact 2 Outcome Indicator	Evidence of Outcome (Measure of Success)
4. At least 65% of participants will report that they will intend to make more sustainable decisions in any of the following areas: a. Transportation b. Energy Conservation. c. Consumption & Waste d. Food	All families in both groups reported they are very likely or likely to make sustainable decisions after visiting the exhibit. 87% of Group 1 and 76% of Group 2 families reported they are very likely to make sustainable decisions. Additionally, at least 90% of Group 1 and 87% of Group 2 families were able to identify sustainable choices in each of the content areas.

Conclusions & Recommendations for the Field

Survey results indicated all outcomes were achieved. Families captured the big idea. They demonstrated awareness of factors that support sustainable decision-making skills and identified ideas, and examples that support those skills. Families also reported that they intend to make sustainable decisions in the future.

The following recommendations for future projects emerged from the evaluation findings:

- **Continue to build on decision-making skills using the three-pillar framework.**
- **Partner with Hispanic-serving organizations to recruit attendees and study participants.**
- **Sustainability is a challenging concept. Promote more understanding of decision-making skills.**
- **Encourage learners with higher levels of sustainability understanding to motivate others.**

Introduction to the *Sustainability* Project

As part of the National Science Foundation funded *Sustainability: Promoting Sustainable Decision Making in Informal Education* project, the Oregon Museum of Science and Industry (OMSI) and its partners developed a bilingual (Spanish/English) exhibition, event series, outreach campaign, and website for the public. The goal of these deliverables was to promote sustainable decision making by building skills that allow participants to weigh the tradeoffs of their choices and choose more sustainable practices. The project duration was September 2009–April 2015.

The project team used a positive, story-based approach to engage the target public audience of English- and Spanish-speaking families in the Portland metropolitan area. The deliverables focused on people and places in the area and highlighted simple choices available to everyone.

The project also features professional audience deliverables that build upon the groundbreaking work already done at OMSI in the area of sustainable exhibit development, design, and fabrication.

Project Goals

1. Promote sustainable decision making.
2. Promote sustainable practices for developing, designing, and fabricating exhibits.

Target Audiences

Public Audience

- Families, with a focus on families with middle and high school aged youth
- Residents of the Portland metro area (Clackamas, Washington, and Multnomah counties)
- Underserved audience: parents who prefer to speak Spanish and their families

Professional Audience

- Exhibit developers, designers, and fabricators in non-profit and for-profit sectors
- Secondary audiences include museum administrators and others working in Informal Science Education (ISE) organizations

Project Deliverables

- A 1,500 square foot bilingual (Spanish/English) exhibition, *Clever Together/Juntos somos ingeniosos*, designed to engage the public in developing an understanding of the skills needed for sustainable decision making in their everyday lives
- Bilingual (Spanish/English) outreach campaign that uses access points outside of the museum to encourage people to engage with sustainability-related stories and activities via cellphone or computer (*Local Voices, Clever Choices/Nuestras voces, nuestras decisiones* campaign)
- Eight bilingual (Spanish/English) museum events about sustainable living
- ExhibitSEED workshops for museum professionals on sustainable exhibit development
- A set of documented practices and guidelines, tools, and resources for sustainable exhibit development, design, and fabrication that may become an industry standard (ExhibitSEED.org)

Project Partners

- Coalition for a Livable Future
- Metro Regional Government
- Portland Bureau of Planning and Sustainability
- Portland Community College
- Verde

Overview of *Clever Together, Juntos somos ingeniosos*

Clever Together, Juntos somos ingeniosos is:

- A 1,500 square foot permanent, bilingual (English/Spanish) exhibition at OMSI that promotes sustainable decision making by enabling visitors to build skills, weigh tradeoffs of their choices, and to feel comfortable choosing more sustainable practices.
- A hands-on approach to sustainability that focuses on environmental, economic, and social considerations to decisions.
- An experience designed specifically to focus on everyday choices regarding food, transportation, consumption, and energy in the Portland metro region.

The exhibition includes eight individual components designed to deliver the impacts and indicators outlined below and in the exhibition logic model (See Appendix IV) as well as to communicate the project's big idea: We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.

The Development of *Clever Together, Juntos somos ingeniosos*

A team of OMSI exhibit research and development, evaluation, design, and production staff developed the *Clever Together/Juntos somos ingeniosos* exhibition based on the following evaluation, research, and expert advice:

- Front-end literature research on similar projects, target audiences, and what influences sustainable decision making
- Front-end evaluation about existing understandings of sustainability and sustainable decision making conducted by external evaluators from Portland State University's (PSU's) Community Environmental Services (CES) and OMSI's Visitor Studies and Evaluation team
- Advisor input solicited at two advisor meetings
- Partner input solicited at the two advisor meetings and partner meetings held every 2–4 weeks throughout the project
- Formative evaluation conducted by OMSI's Visitor Studies and Evaluation team and external evaluators from CES regarding visitors' reactions to prototype exhibits
- Remedial evaluation conducted by OMSI's Visitor Studies and Evaluation team and external evaluators from CES to evaluate the use of the completed exhibition during its first three months on display at OMSI

Developing the Deliverables

Front-end evaluation was critical for the development of the overarching structure and messages in the *Clever Together/ Juntos somos ingeniosos* exhibition. During the front-end evaluation, surveys conducted with English- and Spanish-speaking public audiences indicated that the terms "sustainability"[1] in English and "*sostenibilidad*" in Spanish were not universally understood. People who did provide definitions focused primarily on environmental considerations, often related to recycling and resource

[1] "Sustainability is commonly defined as the concept of providing society with current needs in a way that doesn't harm the ability of future generations to meet their needs. Definitions often include the three components environment, economy, and society (sometimes referred to as the three "Ps": planet, prosperity, and people)." Trautmann, Charles H. 2007. *A Change in the Weather: European Museum Coverage of Global Climate Change*. Sciencenter Report, 3. Accessed October 3, 20014 from http://informalscience.org/images/research/A_Change_in_the_Weather.pdf.

use. The purpose of the project was to present sustainability from a more holistic, community-oriented perspective. Therefore, the team decided to focus on introducing a three pillars[2] approach to sustainability that included social, economic, and environmental considerations as the foundation of sustainable decision making.

The team also used literature research, evaluation findings, and advisor/partner insights to develop a set of best practices for sustainability educationthat guided the exhibition development process. These best practices included:

- Incorporating relatable stories and real life experiences of diverse members of the community.
- Making messaging positive and action-oriented.
- Making content directly relevant to the local community by sharing regionally specific content and resources necessary for taking action.

The team then integrated the sustainability best practices and the three pillars model of sustainability to inform their approach to developing the exhibition. The approach focused on the following:

- Promoting sustainable decision making by enabling visitors to build skills, weigh tradeoffs of their choices, and to feel comfortable choosing more sustainable practices.
- Using a hands-on approach to sustainability that focused on the environmental, economic, and social considerations of everyday decisions.
- Highlighting choices and considerations that are relevant to families in the Portland metro area related to food, transportation, consumption, and energy.

Measures of Success

Goals of Summative Evaluation

The purpose of the summative evaluation was to determine the extent to which the exhibition achieved the intended impacts and outcomes and to discover emergent outcomes. The evaluation was also designed to determine the effectiveness of changes made during the remedial phase. Desired impacts and outcomes for the exhibition are as follows:

Impact #1: Participants will understand skills associated with sustainable decision making in their everyday lives.

Outcomes:

A. Over 70% of participants will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*
B. 50% of participants will understand skills that support sustainable decision-making abilities.
C. Over 60% of participants will identify available options to make more sustainable decisions.

[2] The United Nations General Assembly defines the three pillars as, "efforts [to] promote the integration of the three components of sustainable development – economic development, social development and environmental protection – as interdependent and mutually reinforcing pillars." 2005 World Summit Outcome, Resolution A/60/1. (15 September 2005). p.11-12. Accessed October 3, 2014 at http://data.unaids.org/Topics/UniversalAccess/worldsummitoutcome_resolution_24oct2005_en.pdf

Impact #2: **Participants will be encouraged to engage in more sustainable practices in the following categories: Transportation, Energy Conservation, Consumption & Waste, and Food.**

Outcome:

At least 65% of participants will report that they intend to make more sustainable decisions in any of the following areas: **Transportation, Energy Conservation, Consumption & Waste, and Food.**

Evaluation Methods

PSU's CES planned, executed, and reported on all aspects of the evaluation activities with input from OMSI's project team. Survey research was conducted within the *Clever Together, Juntos somos ingeniosos* exhibition. During the research, a standard bilingual sign was posted outside of the exhibition area at eye level to inform other visitors that research was being conducted.

Participants

Participants were eligible for the study if their family group included one adult parent/caregiver (over 18) and one child aged 10–17. All participants also confirmed they had not visited OMSI in the six months prior to the study. Participants were observed as a family group and all participants were cued. "Families," "family group," and "participants" are used interchangeably throughout this report as the unit of analysis.

Group 1:

A total of 30 surveys were administered to family group members recruited for participation as they entered the OMSI lobby. These participants preferred the English language survey.

Group 2:

A total of 21 surveys were administered to family group members who were recruited to come to OMSI for participation. These family groups self-reported prior to participation that at least one adult in their group preferred Spanish and the surveys were conducted primarily in Spanish.

Recruitment Strategies

Group 1 participants were recruited in the museum lobby on high-traffic days for families (i.e., non-school days during school breaks) in December 2013. Group 2 participants were invited to participate on two weekend days in January 2014. Group 2 participants were recruited through the distribution of a bilingual flyer (see Appendix I), via email on known Spanish-speaking networks, or through posting at organizations that serve Hispanic communities in the tri-county Portland region.

Group 1, those recruited in the OMSI lobby, received free parking and admission for up to six members of the visitor group as a thank you for agreeing to participate in the study.

Group 2, those recruited specifically to come to OMSI for the study, received free parking and admission for up to six members of their family, free admission for up to four family members at a later date, free tickets to a movie at OMSI's Empirical Theater for four family members, giveaways (e.g., OMSI water bottles, tote bags, seed packets, and small toys), and $40 in cash as a thank you for agreeing to participate in the study.

Sampling Frame
All participant family groups were asked to enter the exhibit area and engage (i.e., visibly participate in exhibit component activities by reading, touching, playing, etc.) with any five of the exhibit components. Groups were given a visual aid that identified the cued exhibit components with photographic images and the component titles. Titles were provided in English for Group 1 and in both Spanish and English for Group 2.

Family Group Characteristics
Group 1: English-preferring visitors in a family group (a group of one adult with one child aged 10–17)
Group 2: Spanish-preferring visitors in a family group (a group of one adult with one child aged 10–17)

Table 1. Family group characteristics (Group 1, N = 30)

Group 1 Characteristics	**Frequency**	**Percentage (%)**	**Mean (*M*)**
Number of Adults	30	-	-
Number of Children	33	-	-
Participant Gender			
Male Adults	11	38%	-
Female Adults	18	62%	-
Participant Age			
Adults	-	-	44
Children	-	-	12

There were significantly more female participants than male participants in Group 1.

Table 2. Family group characteristics (Group 2, N = 21)

Group 2 Characteristics	**Frequency**	**Percentage (%)**	**Mean (*M*)**
Number of Adults	21		-
Number of Children	21		-
Participant Gender			
Male Adults	8	38%	-
Female Adults	13	62%	-
Participant Age			
Adults	-	-	37
Children	-	-	13

There were significantly more female participants than male participants in Group 2.

Instruments
Post-Use Surveys
Group 1 families participated December 21, 22, and 23, 2013. Group 2 families participated January 19 and 20, 2014. While recruitment methods for Group 1 and Group 2 were designed differently to meet the targeted participation rates, participation methods were the same and involved eligibility screening, engagement with the exhibition, and a post-use survey. In all cases, the purpose of the study

was explained to potential participants and they were assured of the anonymity and confidentiality of their responses. Family groups who chose to participate gave their verbal consent.

Each participating family group was asked to visit any five of the exhibit components (see list in Appendix II). After participants engaged with the exhibition, surveyors asked each family group a series of close-ended and open-ended questions about the group's experience with the overall exhibition and the exhibit components with which they interacted. Each family member was encouraged to participate. The survey also included a self-administered section with demographic items for adults (see Appendix III for the survey).

Evaluation Process
Methods conducted through the summative evaluation phase involved collaboration between members of the Evaluation staff and the OMSI Sustainability Team. The measures of success guided the development of evaluation instruments, while the Sustainability Team used the research to gain important insights about the exhibition. Thus, the design of survey instruments reflects a strategic compromise between evaluation of intended outcomes through the measures of success and feedback for the team. The methods and instruments were developed iteratively through testing on the museum floor and with Spanish-speaking PSU research staff. The bilingual PSU staff contributed to the design and translation of the survey instruments to make sure the content was appropriate in both languages. The same staff also reviewed the study protocols and conducted the survey research.

Findings

Post-Use Survey Results
Survey Responses
Each family group was asked a series of survey questions. Responses were recorded for all adults and children between the ages of 10–17. Responses are reported as family group responses, not individual participant feedback. Findings are organized by participant group, but not for comparative purposes. Comparison between the two groups was not a goal of the research and is not encouraged.

The following results include the questions that address the specific intended outcomes that were defined in the project logic model (see Appendix IV). Each question is followed by a brief description of the outcome it was designed to address. Some of the question responses were recoded to gain deeper understanding through more detailed and richer insights as they relate to the defined outcome. The targeted outcomes – or measures of success – were influential in the design of the questions, but the results did not always provide direct indications of whether or not outcomes were achieved. Rather, the success of some outcomes was inferred indirectly based on the results, and sometimes from more than one question. Rich data, when available, were used to gain significant insights into participant attitudes and understandings beyond the intended outcomes, but on occasion data were not substantive enough to yield deeper insights.

Q1. What are the primary 1–2 messages of the exhibit?
Outcome Indicator for Question 1: Over 70% of visitors will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*

The responses to this question were analyzed as indicators of participant understanding of the exhibit's "big idea." The analysis revealed that each family provided a response that reflected at least one of the three pillars of sustainable decision making and their ability to have an impact on such pillars, thus achieving the intended outcome. (The project promoted an approach to sustainable decision making that involved identifying and weighing environmental, social, and economic impacts of decisions.) While in both Group 1 and Group 2, 100% of the families captured the big idea, the most frequent responses were about impacts related to the environmental pillar while impacts related to the economic pillar were least frequent. A small percentage of each group also identified factors related to more than 1 pillar (Tables 3 and 4).

Table 3. Group 1 family responses to question 1, N = 42*

Sustainability Pillar	Frequency	Percentage (%)
Environment	29	69%
Social	12	29%
Economic	1	2%
2+ Pillars**	7	17%

*Responses could fall under more than one category. All 30 Group 1 families provided at least one response.
**The 2+ pillar responses were also identified above with the corresponding pillar.

Table 4. Group 2 family responses to question 1, N = 34*

Sustainability Pillar	Frequency	Percentage (%)
Environment	21	62%
Social	9	26%
Economic	4	12%
2+ Pillars**	9	27%

*Responses could fall under more than one category. All 21 Group 2 families provided at least one response.
**The 2+ pillar responses were also identified above with the corresponding pillar

Responses often emphasized one pillar more than others. For example, the majority of Group 1 and Group 2 families said the primary messages of the exhibition were about or related to the environment. Some of the 2+ pillar messages mentioned by Group 1 participants included:

- *"Working together to be more efficient and saving resources."*
- *"Building a better world starts with you."*
- *"Being aware. Everything is connected."*

Some of the 2+ pillar messages from Group 2[3] participants included:

- *"To realize what we're doing by wasting energy, find ways to conserve. Not only is it affecting us, it's affecting stuff like global warming."*
- *"That you have to take care of our planet. With the economy and society and the environment we can save money and take care of the environment."*

[3] Group 2 responses were translated by bilingual staff into English, to be understood in the language of the report.

Q2. Please describe your experience of the exhibition:
This question was not directly tied to a specific outcome, but rather to the overall experience of the exhibition. Responses demonstrated whether participants were positively engaged, an important step in attitude development.

Most Group 1 families described their experience with the exhibit in some way as positively engaged. Examples of positive responses included:

- *"Fun, Games."*
- *"Lots of participation. Hands On."*
- *"Interesting. Different ways to help people learn. It was hands-on. Good for kids, better learning."*
- *"Enjoyed, good learning experience. Refreshers. Green friendly."*

Whereas an example of a negative response was:

- *"I need more examples on some things…I was doing something wrong – I think exhibits should offer alternatives not just, 'don't do this.'"*

(Table 5.)

Table 5. Group 1 family responses to question 2, N = 35*

Exhibit Experience	Frequency	Percentage (%)
Positive	28	80%
Negative	6	17%
Neutral	1	3%

*Responses could fall under more than one category. All 30 Group 1 families provided at least one response.

All Group 2 families said their experience with the exhibit was positive. Examples of responses included:

- *"It really caught my attention that 40% of food is thrown out and I realize that we can be conscientious at home."*
- *"It's giving us the message of how to prevent the use of electricity and being part of nature."*

(Table 6.)

Table 6. Group 2 family responses to question 2, N = 21

Exhibit Experience	Frequency	Percentage (%)
Positive	21	100%
Negative	-	-
Neutral	-	-

Q3. Overall, how much *impact* do you think your own choices can have on the environmental, social, and economic wellbeing of your community? ☐ Large ☐Medium ☐Small
Outcome Indicator for Question 3: Over 70% of visitors will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*

The responses to this question were used as an indirect measure of participant attitudes about their perceived capacity for impact. If participants perceived they had a medium or large impact, they captured the big idea regarding the positive impact of their decisions.

The majority of Group 1 families (90%) indicated that they think their choices have a significant impact (large or medium) on their community. A positive response to the question indicates that participants see a clear connection between their personal decisions and a more sustainable community (Table 7). Almost all Group 2 families (96%) indicated that they think their choices have a significant impact on their community, while the majority (86%) thinks their impact can be "large" (Table 8).

Table 7. Group 1 family responses to question 3, N = 30

Impact Level	Frequency	Percentage (%)
Large	17	57%
Medium	10	33%
Small	3	10%

Table 8. Group 2 family responses to question 3, N = 21

Impact Level	Frequency	Percentage (%)
Large	18	86%*
Medium	2	10%
Small	1	5%

* When rounded, percentages do not add up to exactly 100%.

Q4. What types of factors do you need to consider when making sustainable choices?
Outcome Indicator for Question 4: Over 60% of participants will identify available options to make more sustainable decisions.

The responses to this question were used to look at whether participants identified factors or options to make more sustainable decisions. If participants mentioned a relevant factor or option, then their response was coded as "Yes", if not, their responses were coded as "No."

In this case, almost all Group 1 families identified some available options when making sustainable choices. Some of the factors mentioned included:

- *"What effects they have on places, things and people."*
- *"Customize to your own family. It has to make sense on a personal level…."*
- *"Make a conscience effort and be willing to change daily habits to leave the planet a better place."*

(Table 9.)

Table 9. Group 1 family responses to question 4, N = 30

Identified Factors	Frequency	Percentage (%)
Yes	26	87%
No	4	13%

All Group 2 families identified some available options when making sustainable choices. Some factors mentioned included:

- *"You can see how much light or energy you are using if you leave the lights on or the heat; that makes a difference."*

- *"It's very good for people to realize that we have to do something so that we take a little more care of everything."*
- *"If we choose to stay at home watching TV, they don't exercise and get a lot of weight and we can prevent obesity and diabetes if we choose the healthy way."*

(Table 10.)

Table 10. Group 2 family responses to question 4, N = 21

Identified Factors	Frequency	Percentage (%)
Yes	21	100%
No	-	-

The next tables show responses to Question 4 coded in the context of the following outcome indicator: Outcome Indicator for Question 4: Over 70 % of visitors will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*

Responses for question 4 were among the most thoughtful of all answers. The responses provided a good indicator of how well families captured the big idea in terms of the sustainability pillars as well as in their understanding of the relationship between their choices and their impacts on the community. All families were able to list at least one example of a sustainable choice from the exhibition and thereby demonstrate a basic understanding of the big idea. Families demonstrated a deeper understanding if they provided examples from more than one pillar of sustainability. Combined, 100% of Group 1 and 100% of Group 2 families demonstrated at least a basic understanding of the big idea.

Examples of a deeper understanding from Group 1 included:

- *"Economy. Environment. Society. Think about long term goals."*
- *"What effects they have on places, things, and people."*

Examples of a deeper understanding from Group 2 included:

- *"If we take care of the environment we are going to have economic benefits…we would have a better way of living and the planet would be healthy."*
- *"If we would all work together in making decisions collectively it would help to conserve the wellbeing of the planet."*

Table 11. Group 1 family recoded responses to question 4, N = 30

Level of Understanding	Frequency	Percentage (%)
Deeper Understanding	24	80%
Basic Understanding	6	20%
No Understanding	0	0%

Table 12. Group 2 family recoded responses to question 4, N = 21

Level of Understanding	Frequency	Percentage (%)
Deeper Understanding	19	90%
Basic Understanding	2	10%
No Understanding	0	0%

Q5. What are some ideas for sustainable choices that you came across in the exhibit about…?
Food Consumption & Waste Energy Conservation Transportation

When asked to provide ideas of sustainable choices, Group 1 and Group 2 families provided examples of choices they could make across all four content areas (Tables 13 and 14). Most families in both groups were able to provide examples in each category. Almost all Group 1 families mentioned things about:

- Food:
  - *"Pack leftovers well"*
  - *"Buy less food at one time. Plan meals"*
  - *"Freeze leftovers and share meals"*
- Consumption & Waste:
  - *"Try to buy with less packaging"*
  - *"Recycle. Use only what you need"*
  - *"Not wasting what you have is smart at any level"*
- Energy Conservation:
  - *"Buy energy efficient appliances"*
  - *"Know what you want before opening the fridge. Conserve heat, keep the temp low."*
- Transportation:
  - *"Ride public transit."*
  - *"Bike and walk more."*
  - *"Try other ways besides the car."*

All Group 2 families mentioned things about:

- Food:
  - *"To keep what you don't use. If we have animals like pigs, we give it to them."*
  - *"Getting smaller portions."*
- Transportation:
  - *"Walk more, use other modes of transport like the MAX or carpool."*
  - *"Instead of everyone having cars they should use bus or bicycle because cars make a lot of pollution."*

Most Group 2 families provided examples of:

- Energy Conservation:
  - *"Don't keep electronics plugged in."*
  - *"Use daylight instead of lamps."*
- Consumption & Waste:
  - *"Reuse the things we have at home, find a second life for them."*

Table 13. Group 1 family responses to question 5, N = 30*

Content Areas	Frequency	Percentage (%)
Food	26	90%
Consumption & Waste	26	90%
Energy Conservation	28	97%
Transportation	29	100%

*Responses could fall under more than one category.

Table 14. Group 2 family responses to question 5, N = 21*

Content Areas	Frequency	Percentage (%)
Food	21	100%
Consumption & Waste	18	86%
Energy Conservation	20	95%
Transportation	21	100%

*Responses could fall under more than one category.

Q6. How likely are you to try (or continue) making sustainable decisions after visiting the exhibit?
☐ Very likely ☐ Somewhat ☐ A little ☐ Not

Outcome Indicator for Question 6: At least 65% of participants will report that they intend to make more sustainable decisions in any of the following areas: Food, Consumption & Waste, Energy Conservation, or Transportation.

The majority of Group 1 and Group 2 families indicated that it is very likely they will continue to or plan to make sustainable decisions after visiting the exhibit (Tables 15 and 16). This question did not directly address the four content areas, but the implication given the context of the exhibition and the survey is that these areas are embedded in those sustainable decisions. Moreover, responses in question 5 (see Tables 13 and 14) indicate very high awareness among family groups about how to make sustainable choices in each content area.

Table 15. Group 1 family responses to question 6, N = 30

Likelihood/Intention	Frequency	Percentage (%)
Very Likely	26	87%
Somewhat	4	13%
A Little	-	-
Not	-	-

Table 16. Group 2 family responses to question 6, N = 21

Likelihood/Intention	Frequency	Percentage (%)
Very Likely	16	76%
Somewhat	5	24%
A Little	-	-
Not	-	-

Q7a. Do you think the examples, images, ideas, and activities presented are relevant to your everyday life?
☐ Yes ☐ No ☐ Not sure

Almost all Group 1 families thought the exhibit was relevant to their everyday life (Table 17). All Group 2 families thought the exhibit was relevant to their everyday life (Table 18).

Table 17. Group 1 family responses to question 7a, N = 30

Exhibit Relevance	Frequency	Percentage (%)
Yes	29	97%
No	1	3%
Not Sure	-	-

Table 18. Group 2 family responses to question 7a, N = 21

Exhibit Relevance	Frequency	Percentage (%)
Yes	21	100%
No	-	-
Not Sure	-	-

Q7b. What is most relevant?

The following tables show family responses to question 7b that are related to the content areas of interest (i.e., Food, Consumption & Waste, Energy Conservation, and Transportation) as defined in the project logic model (see Appendix IV).

About half of Group 1 families mentioned things related to Consumption & Waste or Energy Conservation (Table 19). Group 1 responses included direct actions and practices in the four content areas which indicated their understanding of topic-related skills associated with the exhibition and their relevancy.

Table 19. Group 1 family responses to question 7b, N = 30*

Relevant Content Areas	Frequency	Percentage (%)
Food	10	33%
Consumption & Waste	16	53%
Energy Conservation	15	50%
Transportation	10	33%
No Response	2	7%

*Responses could fall under more than one category.

A little over half of participants mentioned things related to Energy Conservation (Table 20). Group 2 responses included direct actions and practices in the four content areas, sometimes in the context of two or more pillars, which indicated their deep understanding of sustainability skills and their relevancy.

Table 20. Group 2 family responses to question 7b, N = 21*

Relevant Content Areas	Frequency	Percentage (%)
Food	7	33%
Consumption & Waste	9	43%
Energy Conservation	11	52%
Transportation	9	43%

*Responses could fall under more than one category.

Q8. What 3–5 things do you and your household do, to contribute to a sustainable community?
Outcome Indicator for Question 8: 50% of participants will demonstrate an understanding of skills that support sustainable decision-making abilities.

The responses to question 8 are interpreted as an indication of the understanding of skills that support sustainable decision-making abilities. As such, if participants mentioned something in their response that is a "sustainable" behavior as defined by the project, then their response was coded as "Yes" in terms being able to demonstrate an understanding of these skills.

All Group 1 families mentioned doing things that contribute to a sustainable community and thus reflect an understanding of skills that support sustainable decision-making abilities (Table 21).

Table 21. Group 1 family responses to question 8, N = 30

Understanding of Skills	Frequency	Percentage (%)
Yes	30	100%
No	-	-

Almost all Group 2 families mentioned doing things that contribute to a sustainable community and thus reflect an understanding of skills that support sustainable decision-making abilities (Table 22).

Table 22. Group 2 family responses to question 8, N = 21

Understanding of Skills	Frequency	Percentage (%)
Yes	20	95%
No	1	5%

The following tables show family responses to question 8 that are related to the content areas of interest as defined in the project logic model. The inclusion of these data provides a more detailed picture of participant responses to this question in terms of what participants actually do.
Most of Group 1 families mentioned that they do things related to Consumption & Waste and Energy Conservation (Table 23) and less than half mentioned Transportation and Food. Many families said they "*recycle*" or "*conserve energy*." While all Group 1 families mentioned things with environmental impacts, some group 1 families mentioned actions that also considered the social or economic pillar, to indicate their deeper understanding of sustainable skills. For example one family said they *"buy local"* and another one claimed to *"shop at Farmer's markets."*

Table 23. Group 1 family recoded responses to question 8, N = 30*

Things You Do	Frequency	Percentage (%)
Food	12	40%
Consumption & Waste	26	87%
Energy Conservation	23	77%
Transportation	13	43%

*Responses could fall under more than one category.

Most Group 2 families mentioned that they do things related to Consumption & Waste and Energy Conservation, while about half mentioned things related to Transportation and over a third mentioned

Food. Many group 2 families also mentioned actions that considered more than one pillar, to indicate their deeper understanding of sustainable skills. For example one family said they *"recycle and save money"* and another one said they *"share food."*

Table 24. Group 2 family recoded responses to question 8, N = 21*

Things You Do	Frequency	Percentage (%)
Food	8	38%
Consumption & Waste	15	71%
Energy Conservation	14	67%
Transportation	10	48%

*Responses could fall under more than one category.

[4]Q10. Before visiting the exhibit, how familiar were you with the concept of sustainability?
☐***Very*** ☐***Somewhat*** ☐***A little*** ☐***Not*** ***Comment***

The responses to this question help frame participants' familiarity with the concept of sustainability prior to engaging with the exhibit.

All Group 1 families said they were somewhat or very familiar with the concept of sustainability prior to visiting the exhibit (Table 25).

Table 25. Group 1 family unit responses to question 10, N = 30

Familiarity	Frequency	Percentage (%)
Very	12	40%
Somewhat	18	60%
A Little	-	-
Not	-	-

Most Group 2 families said they were somewhat or a little familiar with the concept of sustainability prior to visiting the exhibit (Table 26).

Table 26. Group 2 family unit responses to question 10, N = 21

Familiarity	Frequency	Percentage (%)
Very	1	5%
Somewhat	9	43%
A Little	9	43%
Not	2	9%

Q11. Did the exhibit increase your familiarity with the concept of sustainability…?
A lot ***Somewhat*** ***A little*** ***Not at all*** ***Comment***

[4] Question 9 was about the use of sustainable practices in the creation of the exhibition. The responses lacked interesting insight and were of little relevance to an external audience, thus are excluded from this report.

The responses to this question help frame participants' familiarity with the concept of sustainability after engaging with the exhibit.

Almost 40% of Group 1 families reported that the exhibit increased their familiarity with the concept of sustainability "a lot" while over half said it "somewhat" increased their familiarity (Table 27).

Table 27. Group 1 family responses to question 11, N = 30

Increased Familiarity	Frequency	Percentage (%)
A Lot	11	38%
Somewhat	17	55%
A Little	2	7%
Not	-	-

Most Group 2 families said that the exhibit increased their familiarity with the concept of sustainability by "a lot" (Table 28).

Table 28. Group 2 family responses to question 11, N = 21

Increased Familiarity	Frequency	Percentage (%)
A Lot	17	81%
Somewhat	4	19%
A Little	-	-
Not	-	-

Exhibit Impact Discussion

Impact Summary

Impact 1: Participants will understand skills associated with sustainable decision making in their everyday lives.

Outcome Indicators	Evidence of Outcome (Measure of Success)
1. Over 70% of participants will capture the big idea: *We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts.*	100% of Group 1 and Group 2 families captured the big idea, as indicated by responses that identified the impacts of at least one of the three pillars of sustainability. The environmental pillar was mentioned most frequently, by 69% of Group 1 and 62% of Group 2 families. All families in both groups demonstrated at least a basic understanding of the big idea when asked what factors to consider when making choices. 90% of Group 1 and 96% of Group 2 reported their choices can have a medium or large impact on their community.
2. 50% of participants will understand skills that support sustainable decision-making abilities.	87% of Group 1 and 100% of Group 2 families identified ways to contribute to a sustainable community. Responses reflected an understanding of skills that support sustainable decision-making abilities. The most common content areas mentioned were Energy Conservation and Waste & Consumption.
3. Over 60% of participants will identify available options to make more sustainable decisions.	87% of Group 1 and 100% of Group 2 families were able to identify available options.

Impact 2. Participants will be encouraged to engage in more sustainable practices in the following categories:

A. Transportation B. Energy Conservation. C. Consumption & Waste D. Food

Outcome Indicator	Evidence of Outcome (Measure of Success)
4. At least 65% of participants will report that they will intend to make more sustainable decisions in any of the following areas: a. Transportation b. Energy Conservation. c. Consumption & Waste d. Food	All families in both groups reported they are very likely or likely to make sustainable decisions after visiting the exhibit. 87% of Group 1 and 76% of Group 2 families reported they are very likely to make sustainable decisions. Additionally, at least 90% of Group 1 and 87% of Group 2 families were able to identify sustainable choices in each of the content areas.

Outcomes Summary

In summary, all outcomes were met:

1. The Exhibit Big Idea
Participating families captured the big idea- all families provided information about the exhibit that was relevant to the big idea.

2. Understanding of Skills
When asked about specific behaviors at home, families clearly demonstrated an understanding of factors necessary to support sustainable decision-making skills. The responses suggested families had some prior knowledge of sustainable behavior, yet increased that knowledge through their exhibit experience. .

3. Identifying Options
Participants were able to easily identify factors, ideas, exhibit examples, and content that they thought supported making more sustainable decisions. It was also clear through family group responses that the content of the exhibit was relevant to their everyday life – a key factor in both the development of the exhibit and the creation of the content.

4. Future Intentions
All families who experienced the exhibit reported that they intend to try or continue to make more sustainable decisions in the future.

Beyond Outcomes
The topic of sustainability within the context of social, economic, and environmental concern is nebulous and difficult to measure, not only in English, but also in Spanish. The intended outcomes for the *Clever Together/ Juntos somos ingeniosos* exhibit were defined as simple percentages of family groups. Such simplicity should not mislead project stakeholders or other professionals into thinking that it was easy to develop an exhibit on the topic of sustainability and attain those percentages. Solidly engaging multi-generational learners from the general public with a vague and complex concept is a success greater than these metrics can capture. All of the families who participated in this research were exposed to reaffirming ideas, messages, and real-life examples of what type of decisions can lead to more sustainable living. This exhibition, an introduction for some and a reaffirmation for many, provided a valuable learning experience for participating families.

Considerations and Lessons Learned for the Field

Overall Impact of the Exhibition
This exhibition promoted understanding and willing attitudes with regard to sustainable options in decision-making. Subsequent projects could continue to build on this work to help exercise learners' decision-making skills using the three-pillar framework.

Opportunities for Further Understanding
Families captured the big idea but there is room for increased understanding. Many families seemed to learn from the examples from the exhibition, but not all demonstrated how they would attempt to bring sustainable decision-making into other considerations. Yet, overall, they captured at least the basic idea and their general understanding of potential impact and intentions was moderate to high.

Most emphasis remained on the environmental pillar and families continually overlooked the economic pillar. All families tended to mention an aspect of sustainability related to at least one pillar, while some mentioned at least two. There is room for improvement on grasping the three pillars model as an integrated concept.

The understanding of skills was high but in some ways challenging to get at conceptually. Energy and recycling were easy buy-ins, but across families and group types, the understanding of skills as they relate to decisions was less common.

Choice of Methods
It is challenging to find the right methods and the right questions to get what is needed for evaluation purposes. At times, participant responses revealed richer insights that were not directly relevant to the outcome indicators. At other times, the chosen methods produced unexpected benefits.

Recruitment of Spanish-speaking families through collaboration with Hispanic-serving organizations and networks was an effective evaluation method. Moreover, invited guests were generally engaged in both the experience and the survey. In the pursuit of a targeted audience, recruitment methods may also provide opportunities to build valuable partnerships including those with agencies that represent under-served people.

Implications for Future Efforts
Overall families demonstrated varying depth of understanding of sustainability as an integrated concept. All families demonstrated at least a basic level of understanding that choices have impacts. Future efforts could build on and expand the basic grasp of sustainable decision-making. Families that demonstrated a deeper level of understanding had responses which integrated two or more pillars or considered the larger impacts of their own decision-making skills. For those families with a greater depth of understanding, future efforts could go the next step to include a call to action or inspire leadership that motivates others to recognize the impact of their choices.

Appendix I. Recruitment Flyer in English & Spanish

Group 2 English Recruitment Flyer

Help the Oregon Museum of Science & Industry (OMSI) with a new exhibit!

Who: You! One Spanish-speaking adult and your 10– to 17–year old child!

What: A new Spanish/English bilingual exhibit about sustainability called *Clever Together, Juntos somos ingeniosos*

When: Sunday, January 19; Monday, January 20; Saturday, January 25; Sunday, January 26

Where: At OMSI, 1945 SE Water St., Portland, OR (**RSVPs only please**)

As a way to say thank you, participants receive:

- **Free admission** for up to **6 members** of your family on the day of the study!
- **Free admission** for up to **4 family members** at a later date!
- **Free tickets** to an OMSI OMNIMAX movie for **4 family members** at a later date!
- **OMSI water bottles, tote bags, seed packets, or other fun giveaways!**
- **$40 thank you** to use however, wherever you want! Free parking, too!

Why: When we design new exhibits, we like to talk to the people who use them to make sure they are as engaging and effective as possible. We would like to invite you to OMSI to view an exhibit designed for kids and adults and tell us what you think about it.

Participation is voluntary, and no penalty is given if you choose not to participate at any time. Contact us to confirm your interest. Tell us your dates of availability and how to contact you.

***OMSI** is a science and technology museum with fun and educational hands-on exhibits, a large-screen theatre (OMNIMAX), and a planetarium. www.omsi.edu.*

For more information, or to participate and RSVP, please contact:

Portland State University at **503-725-2055**

clever together
juntos somos ingeniosos

Group 2 Spanish Recruitment Flyer

¡Colabora con la nueva exhibición del Museo de ciencia y industria de Oregón (OMSI)!

¿Quiénes?: ¡Usted! Otro adulto y su hijo/a (de entre 10 y 17 años)

¿Qué?: Una nueva exhibición bilingüe en inglés y español sobre sustentabilidad, llamada *Juntos somos ingeniosos*

¿Cuándo?: el domingo 19 de enero, el lunes 20 de enero, el sábado 25 de enero y el domingo 26 de enero

¿Dónde?: En OMSI, 1945 SE Water St., Portland, OR (**Se ruega confirmación**)

Como agradecimiento los participantes recibirán:

- ¡**Entradas gratis** para **6 miembros de su familia** el día de la visita!
- ¡**Entradas gratis** para una visita adicional en el futuro para **4 miembros de su familia**!
- ¡**Boletos gratis** para **4 miembros de su familia** para ver una película de OMNIMAX en su próxima visita!
- **¡Botellas de agua de OMSI, bolsos de mano, paquetes de semillas, y más obsequios!**
- ¡**Un obsequio de $40** para usar como quiera! ¡Más estacionamiento gratis!

¿Por qué?: Cuando diseñamos nuevas exhibiciones nos interesa saber la opinión de la gente que va a visitarlas; así nos aseguramos que son lo más interesante y efectivas posible. Les invitamos a OMSI para visitar una exhibición diseñada para familias y hacernos llegar sus impresiones.

Su participación es voluntaria y no hay ningún sanción si decide en cualquier momento no participar. Si le interesa participar, le rogamos por favor nos contacte con las fechas en las que está disponible y el medio que prefiere para que le contactemos.

OMSI es un museo de la ciencia y la tecnología que tiene exhibiciones prácticas, divertidas, y educativas, además cuenta con un cine con pantalla grande (OMNIMAX) y otras fabulosas atracciones. www.omsi.edu

Para obtener más información sobre como participar y/o confirmar su asistencia,
por favor contactar a: Portland State University: **503-725-2055**

clever together
juntos somos ingeniosos

Appendix II. Exhibit Components

Exhibit Component Descriptions

Introductory Area
Visitors are welcomed to the exhibition with a series of short animations and Portland-based video clips that are projected on a large screen. These entertaining clips depict diverse people in and around Portland engaging in sustainable behaviors relating to the four content areas of the exhibition: food, energy, consumption and waste, and transportation. The clips show how people are being *Clever Together, Juntos somos ingeniosos*.

We Make Clever Choices!
At this iconic exhibit, visitors work together to build a life-size, self-supporting structure that represents the three pillars of sustainability—society, environment, and economy. When each of the three legs is assembled correctly, a three-sided keystone labeled "sustainability" fits in the center to support the entire structure. An accompanying kiosk that features a model of the three pillars structure explains how visitors can make more sustainable choices by considering how those choices will affect the environment, economy, and society, thereby helping them choose the options with the most benefits.

We Know Our Options!
Visitors to this exhibit explore sustainable options in the Portland metro region by engaging with six content blocks and polling stations relating to each of the following categories: community gardens, farmers markets, lending libraries, public transportation, arts and cultural attractions, and reuse centers. Below each content block, visitors can take a poll and see how their attitudes about each of the six content areas compare to other people who have visited the exhibit.

We Reduce Food Waste!
In this six-player, pinball-inspired interactive, visitors work together to prevent food waste by hitting "food" (balls) into waste reduction targets. Upon approaching the exhibit, visitors must first use the hand crank at the end of the table to mechanically transport the "food" (balls) to the top of the exhibit. From the top, the balls travel down the upright back panel through visual depiction of the food being grown, harvested, transported, packaged, and sold at a market. Once through the panel, the balls reach the pinball-like playing surface from where visitors manipulate fork flippers to divert the balls into the six waste reduction targets, thereby keeping the "food" out of the landfill at the base of the table. Waste reduction targets include buying less, sharing large meals, eating leftovers, freezing for later, eating what you have, and storing food properly.

We Use "Human Power"!
Visitors to this exhibit go on a virtual walk or bike-ride through familiar places in the Portland metro region. As they pedal or walk, they see a changing Portland scene turning on mechanical flip-gear panels before them. Every thirty seconds the scene changes, and every 15 seconds a "fun fact" explaining environmental, social, and economic benefits of biking and walking appears.

We Take Public Transit!
Visitors walk into this life-size cross-section model of a TriMet (regional Portland) bus and automatically trigger one of two audio stories told by real Portland bus commuters about some of the environmental, social, and economic benefits of taking the bus. As the stories play, color photographs featuring pictures of the storytellers light up in the channel cards to help illustrate the stories. Visitors

can press buttons to launch another story or to switch between English and Spanish language versions. Entertaining "Poetry in Motion" channel cards also help to create a fun environment, with poems about environmental, social, and economic benefits of taking the bus.

We Are Energy Savers!
Visitors to this exhibit are challenged to wander about a living room of a house and open a door, flip switches, etc., in order to find seven impactful behaviors that will reduce energy consumption at home. The exhibit addresses behaviors related to heating and cooling energy, powering home appliances, and charging personal electronics. By manipulating the target item (e.g., turning off a power strip switch), a hidden panel is revealed and explains the benefit of doing that behavior at home.

We Are Super Sorters!
At this exhibit, visitors work together to accurately sort objects in a simulated curbside-recycling scenario. As pucks labeled with images of common household waste items (food containers, old worn out shoes, apple cores, etc.) travel by on a rotating table, visitors must correctly sort the items into the five different bins. Each puck sorted correctly earns the group a point, and the object of the activity is to gather as many points as possible before time runs out. Once they master the activity at a slow speed, visitors can challenge themselves by increasing the speed of the turning table. Real objects like computers, plastic bags, and other commonly missorted items are on display in the side bins, with explanations of how to responsibly dispose of them in the Portland metro area.

The Making of *Clever Together, Juntos somos ingeniosos*
At this exhibit, visitors get to glimpse "behind the scenes" of the making of the exhibit. They hear from team members and community partners who were involved in the development, design, and fabrication of the exhibit. Visitors can read about how the project team was thoughtful about equity throughout the development of the exhibit on one side, or how we reduced our dependence on toxics and new materials on the other side. Each panel features several captioned photographs of people who worked on the exhibit and other items that illustrate the panel's content. In the display cases alongside of the copy panels, real sculptures created out of repurposed goods and scrap materials are on display. These sculptures were made by OMSI's design team to create the unique graphics found throughout the exhibit.

Appendix III. Participant Survey

English Participant Survey

Q1. What are the primary 1–2 messages of the exhibit?

Q2. Please describe your experience of the exhibition:

Q3. Overall, how much *impact* do you think your own choices can have on environmental, social and economic wellbeing of your community? ☐ Large ☐ Medium ☐ Small

Q4. What types of factors do you need to consider when making sustainable choices?

Q5. What are some ideas for sustainable choices that you came across in the exhibit about…
Food *Consumption & Waste* *Energy Conservation* *Transportation*

Q6. How likely are you to try (or continue) making sustainable decisions after visiting the exhibit?
☐ Very likely ☐ Somewhat ☐ A little ☐ Not

Q7a. Do you think the examples, images, ideas, and activities presented are relevant to your everyday life?
☐ Yes ☐ No ☐ Not sure

Q7b. What is most relevant?

Q8. What 3–5 things do you and your household do, to contribute to a sustainable community?

Q9a. Did you notice any ways sustainable practices were used to create the exhibit?
☐ Yes ☐ No ☐ Not sure *Comment:*

Q9b. What did you notice?

Q10. Before visiting the exhibit, how familiar were you with the concept of sustainability?
☐ Very ☐ Somewhat ☐ A little ☐ Not *Comment:*

Q11. Did the exhibit increase your familiarity with the concept of sustainability…?
☐ a lot ☐ somewhat ☐ a little ☐ not at all *Comment:*

Q12. Any other feedback or comments?

Spanish Participant Survey

Q1. ¿Cuáles son los 1- 2 mensaje/s principales de la exhibición?

Q2. Por favor, describan sus experiencias en la exhibición.

Q3. En general, cuánto impacto creen que tienen sus propias elecciones sobre el bienestar medioambiental, social, y económico de su comunidad.
__☐Grande __☐ Mediano __☐Pequeño

Q4. ¿Qué tipo de factores hay que considerar cuando se hacen elecciones sustentables?

Q5. ¿Cuáles serían algunas ideas para hacer elecciones sustentables según la exhibición sobre…?
¿La comida? ¿El consumo y el desperdicio? ¿La conservación de la energía? ¿El transporte?

Q6. ¿Qué probabilidad hay de que ustedes intenten (o sigan) tomando decisiones sustentables después de haber visitado a la exhibición?
☐ Muy probable _☐ probable ☐ poco probable ☐ improbable

Q7a. ¿Creen que los ejemplos, ideas, y actividades son relevantes para ustedes?
☐ Si ☐ No ☐ No estoy seguro/a

Q7b. ¿Cuál sería el ejemplo más relevante?

Q8. ¿Qué 3-5 cosas hacen ustedes y su familia para contribuir con una comunidad sustentable?

Q9a. ¿Se fijaron en que se usaron prácticas sustentables para crear la exhibición?
☐ Si ☐ No ☐ No estoy seguro *Comentario:*

Q9b. ¿En qué se fijaron?

Q10. Antes de visitar a la exhibición, ¿qué tan familiarizados estaban con el concepto de sustentabilidad?
☐ Muy familiarizado _☐ familiarizado___ ☐ poco familiarizado___☐ no familiarizado *Comentario*:

Q11. ¿Creen que la exhibición aumentó su familiaridad [con el concepto de sustentabilidad]?
☐ mucho ___☐ de alguna manera ___☐ poco __☐ no *Comentario:*

Q12. ¿Algo que quieran añadir o algún comentario?

Appendix IV. Exhibit Logic Model and Measures of Success

Sustainability Project Logic Model – Public

Public audience strategic impact: This project will promote and help develop decision-making skills and practices associated with sustainable behavior in everyday life and test an industry standard for sustainable exhibit design and fabrication.

Standards/benchmarks: Science in Personal & Social Perspective, benchmarks for grades 5–12 (Populations, Resources, and Environments/Population Growth; Risks & Benefits; (Environmental Quality) NRC, 1996

Target audiences	Project impacts	Educational approach	Deliverables	Deliverable Characteristics and Guidelines	Outcomes
1. Family audience ▪ Focus on parents ▪ Focus on STEM standards for 5th grade – Adult ▪ Portland metro (tri-county) area 2. Spanish-preferred family audience ▪ Focus on parents ▪ Focus on STEM standards for 5th grade – Adult ▪ Portland metro (tri-county) area	Impact 1. Participants will understand skills associated with sustainable decision making in their everyday lives. Impact 2. Participants will be encouraged to engage in more sustainable practices in the following categories: 1. Transportation 2. Energy Conservation 3. Consumption & Waste 4. Food	**Social cognitive characteristics of exhibits and programs that support behavior change (Bandura 2001) include that:** 1. They are attention attractors 2. They are easily remembered 3. They are reproducible on a personal level 4. They motivate people to produce the desired behavior **Situated cognition characteristics for skill building (Brown et al. 1989) through exhibits and programs include that:** 1. They are situated in "authentic" context (physical, personal, social) 2. They encourage role-play or apprenticeship; learning and doing are indistinct 3. They provide multiple outcomes 4. They refine prior skills	1. A 1,500 sq. ft. bilingual (Spanish-English) exhibit 2. A bilingual cell phone campaign 3. Bilingual quarterly events at the museum and in the community on sustainable living for families 4. Bilingual website for families and teachers	**Sustainability campaigns (Futerra 2005):** 1. Easy to understand what the public can do, gives them the skills necessary to do it. 2. Keeps it personal and local. 3. Focuses on changing groups by making behavior convenient and socially desirable. 4. Makes experiences significant and regular. 5. Reminds people of experiences by using "retrieval clues" throughout their everyday lives.	**1,500 sq. ft. bilingual exhibit** 1. Over 70% of participants will capture the big idea: "We can cultivate a more sustainable community by building skills and making decisions that maximize positive impacts." 2. 50% of participants will understand skills that support sustainable decision-making abilities. 3. Over 60% of participants will identify available options to make more sustainable decisions. 4. At least 65% of participants will report that they will intend to make more sustainable decisions in any of the following areas: a. Transportation b. Energy Conservation. c. Consumption & Waste d. Food