An Evaluation of MOSI's Exhibition on Natural Hazards
Visitor Reactions to the Exhibits and Displays of *Disasterville*

Introduction

Earthquakes, hurricanes, wildfires, floods, lightning, tornadoes, and other natural phenomena occur regularly as an on-going part of the natural environment of our planet. There is a clear need to increase public awareness and knowledge of these natural forces and their impact on human existence. Educating the public about effective, and often simple, strategies for protection, mitigation, and recovery based on the latest scientific knowledge, and encouraging them to personally take action, is critical to reducing human suffering, loss of life, and destruction of property from these deadly natural phenomena, both today and in the future.

To address this need, MOSI (Museum of Science & Industry), in collaboration with the Institute for Business & Home Safety (IBHS), developed and implemented a permanent public Exhibition on Natural Hazards. The 9,000 sq. ft. exhibition, known as *Disasterville,* explores the following eight perils that regularly cause destruction, injury and death in the United States: Floods, tornadoes, hurricanes, lightning, hail, wildfire, earthquakes and volcanoes. The exhibition focuses on the science of these natural phenomena, and most importantly, on the science and technology behind current forecasting and mitigation techniques.

Disasterville is comprised of immersive environments, interactive exhibits and games, fortification displays, artifacts and objects, stage demonstrations and a simulated television weather center known as Bay News 9 WeatherQuest. The exhibit environments are designed to be attention arresting, and to open visitors' minds to the science and mitigation messages embedded within the exhibitry. The stage demonstrations provide audience participative educational programs on the science of natural hazards and their mitigation, and on disaster preparedness. The focus of WeatherQuest is to educate visitors about the science and tools behind the forecasting of natural disaster phenomena.

The major goal of *Disasterville* is to educate and empower each person about the science of catastrophic natural phenomena and the steps that can be taken, both personally and at a community level, to reduce the risk of their devastating effects. The target audience for the exhibition is the general public, with a focus on families.

Evaluation Design

Evaluative activities were implemented to determine the exhibition's effectiveness in impacting visitors' learning-related attitudes, behaviors and skills. The evaluative activities were conducted by a team of evaluators within the framework of an outcome-based evaluation design focused on the accomplishment of the exhibition's major goal. The evaluation effort had two inter-related components, formative evaluation and remedial evaluation.

Formative Evaluation was designed to provide information on project implementation, within a time frame and context that encourages project review and, where necessary, project modifications. Formative evaluation activities occurred during exhibit design and initial setup, as well as during the early stages of exhibit tryout.

Remedial evaluation served to provide evidence of the extent to which the project is accomplishing its major goal to educate and empower museum visitors about catastrophic natural phenomena and the actions that can be taken at both a personal and community level to reduce the risk of their effects. Remedial evaluative data also assisted MOSI staff in identifying elements of the exhibition that might be in need of modification for increased effectiveness. Once *Disasterville* was opened to the public--with all or most of its components in place--remedial evaluation became the focus of evaluation efforts.

The current report concentrates on remedial evaluation. Through mutual consultation, MOSI's staff and the evaluators identified the most critical elements of the exhibition for evaluation. Within the context of assessing the exhibition's major goal, the remedial evaluation was guided by several basic questions:

- What knowledge and perspectives do visitors report gaining from their experiences with the *Disasterville* exhibitry?
- Have visitors been challenged by their exhibition experiences to examine, problem solve, explore and discover?
- Have visitors been motivated by their exhibition experiences to extend their learning beyond the exhibition?
- Have visitors been motivated by their exhibition experiences to take action to better protect themselves and their community?
- Do visitors find the exhibitry informative, interesting and enjoyable?

Instrumentation and Procedures

In conducting a remedial evaluation of various exhibits, displays and activities related to *Disasterville*, data collection depended upon strategies to assure a representative mix of respondents by age and by gender. Efforts were made to observe and interview both female and male visitors across three age groupings (19 and under, 20 to 39, and 40 or more).

For the evaluation of the various components of exhibitry, three data collection methods were used. An observation protocol was used to unobtrusively observe visitor interactions with particular exhibits and displays, and the duration of those interactions. An interview protocol was used to probe visitors' perceptions of their experience with the exhibits and displays. Each interview was conducted immediately upon the conclusion of the visitor's engagement with the exhibit or display, and typically was completed in less than a minute. For those *Disasterville*-related activities involving large groups of visitors--specifically Bay News 9 WeatherQuest and the stage demonstration "Recipe for Disaster"--visitor reactions were captured on a reaction form that took less than two minutes for respondents to complete. The questions on both the interview protocol and the reaction form were kept as simple as possible to assure that visitors across a range of ages could understand and respond.

Any data collection tool, to be appropriate for use in the remedial evaluation of *Disasterville*, needed to embody the characteristics of:

- Validity – The instrument should allow meaningful inferences about the attribute(s) the instrument purports to measure.
- Relevance – The instrument should yield information pertinent to judgments regarding the effectiveness of the exhibits.
- Objectivity – The instrument should allow for the collection of data free of damaging biases and response sets.
- Practicality – The instrument should be easy to use within its appropriate context.

Data collection activities were designed to yield relevant information with minimal disruption to the visitors' museum experience. Where choices among data collection approaches were available, the least disruptive and least intrusive technique was selected, consistent with the standards of validity, relevance, objectivity and practicality. All instruments were provided to MOSI staff for review prior to data collection. The data reported below were collected between mid-November 2006 and early March 2007.

Organization of Results

The results of the evaluation of each *Disasterville* exhibit, display or activity that was examined are presented below. For each one, an Introduction is provided that briefly describes the exhibit, display or activity and the data collection procedures used. Following the Introduction is a Summary of Results containing a summary of the findings for that particular exhibit, display or activity. In most cases the findings are based on unobtrusive observations and personal interviews. For activities such as WeatherQuest or the stage demonstration "Recipe for Disaster", the findings are based primarily on reaction sheets completed by the participants. Following the Summary of Results are tables and figures in which the observations and visitor responses are presented by age and gender. All instruments that were used in the data collection effort are presented in the Appendix.

Visitor Reactions to *Disasterville's* Tornado Video Wall

Introduction

Visitors to the Tornado Video Wall in *Disasterville* were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 100 visitors varying in age and gender were observed at the exhibit, and a total of 65 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who activated the exhibit and/or observed the results of its activation. The data were collected between November 18 and 27, 2006.

The Tornado Video Wall is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It presents visitors with three duplicate "video walls" each comprised of 16 video screens arrayed in a 4 x 4 display. The visitor to any one of these walls selects from 16 different video images surrounding the 4 x 4 display. Each image is of a tornado, its formation, or its effects. The selected image then appears across the 4 x 4 display monitor as one enlarged image. By operating a panel of buttons, the visitor may select any one of the 16 video images for magnified display. Having three duplicate "video walls" allows the exhibit to accommodate several visitors simultaneously, each selecting his or her own images for magnified display. Interviews were limited to those visitors who activated two or more images or observed the results of two or more images being activated.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of visitor engagement with the Tornado Video Wall was relatively brief, seldom lasting more than 40 seconds. The typical time of engagement for visitors in each of the age by gender groupings was between 20 and 30 seconds. No difference in duration of engagement was noted across age or gender (Figure 1). A distinct majority of visitors in all age by gender groupings engaged the panel of buttons, thereby creating magnified video images, and observed these images. Visitors who merely looked on without actively engaging the exhibit were most likely to be older adults (Figure 2).

Interviews

Of those who were interviewed about their experience with the Tornado Video Wall, a slight majority in each age by gender grouping indicated that their neighborhood had never been threatened by a tornado; approximately 40% of the interviewees in most of the groupings did report being threatened (Figure 3). All or virtually all interviewees, regardless of age or gender, reported that they found the exhibit easy to understand and operate. No interactive exhibit in *Disasterville* garnered a more positive response to this question (Figure 4). When asked if they found the exhibit interesting, the interviewees responded differently depending on age. Those 19 and under and those 40 or more were generally quite positive on the question; most females and males in each of these age groupings found the exhibit very interesting. Only a few of the female and male interviewees in the 20 to 39 grouping reported the exhibit to be very interesting (Figure 5). In regard to whether the exhibit was found to be informative, responses again varied somewhat depending upon age. Females and males 19 and under tended to be quite positive in their response to the question. The adults tended to be somewhat less positive. This pattern

suggests that adult interviewees were not as convinced as the younger interviewees as to the information value of the exhibit (Figure 6).

Learning and Perceptions

When asked whether, based on their experience with the exhibit, they have a better understanding of how tornadoes form, interviewees gave mixed responses. However as a general pattern, males across the three age groupings gave somewhat more positive responses than females. The least positive response came from females 20 to 39 (Figure 7). When asked, "Does this experience make you want to learn more about the science underlying the prediction of tornadoes?" the majority of interviewees in all age by gender groupings responded affirmatively. Females and males 19 and under were the most affirmative (Figure 8). When asked, "What changes, if any, would make the exhibit more enjoyable or more informative?" interviewees offered a variety of suggestions. The most frequently occurring suggestion concerned the desire to have textual or narrative information provided. Other suggestions included the addition of sound and the substitution of one large screen for the 16 small screens (Table 3).

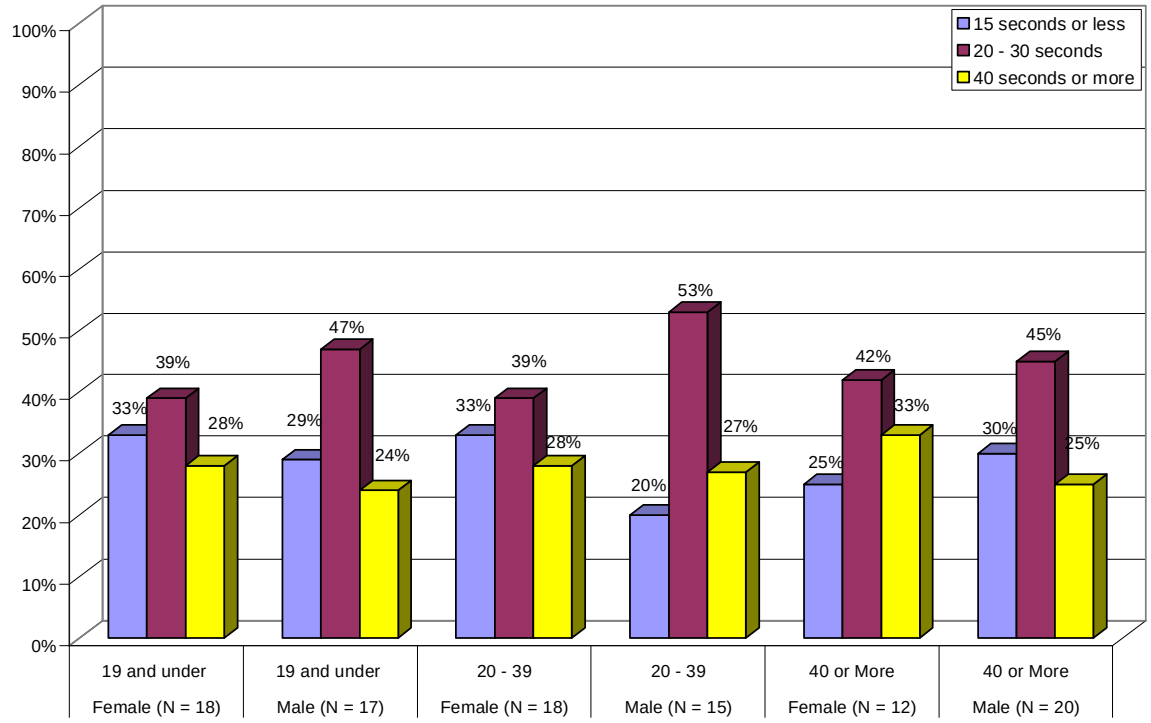
Tornado Video Wall Tables and Figures

Table 1

Number of Observations for Tornado Video Wall, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	18	
	Male	17	
Subtotal:		35	(35)
20 - 39			
	Female	18	
	Male	15	
Subtotal		33	(33)
40 or More			
	Female	12	
	Male	20	
Subtotal		32	(32)
Total		100	(100)

Tornado Video Wall
Figure 1. Duration of Engagement by Gender and Approximate Age



Tornado Video Wall
Figure 2. Visitor Action by Gender and Approximate Age

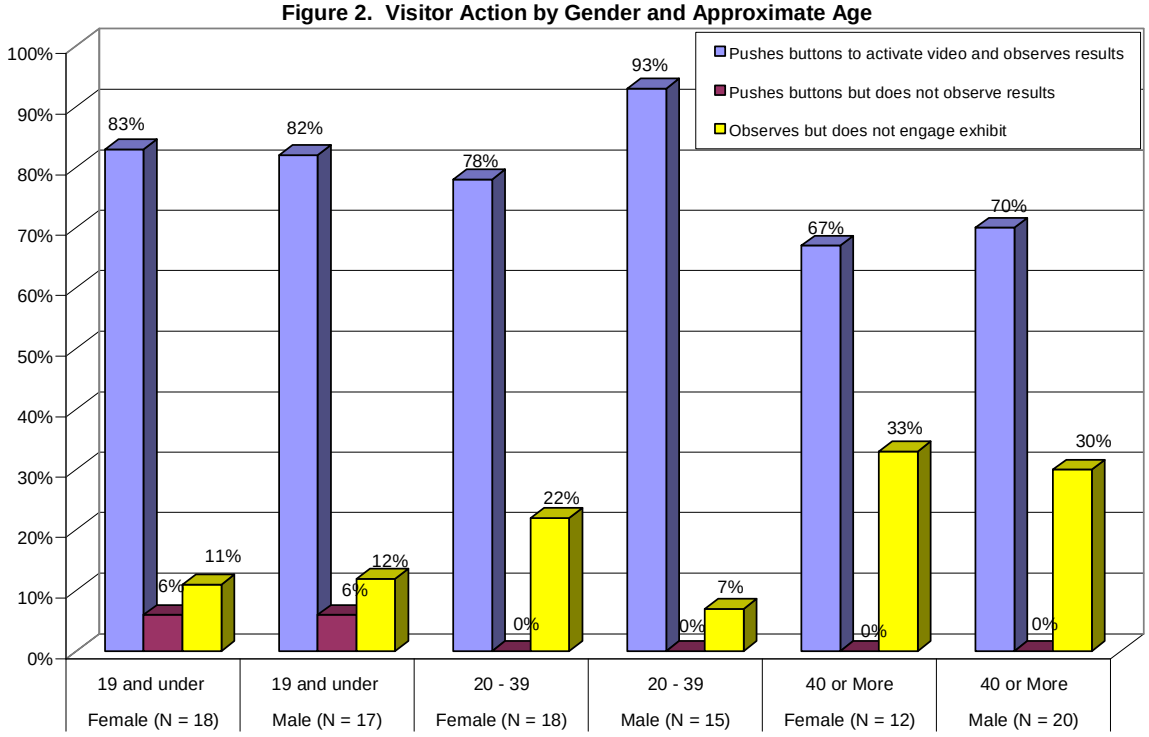
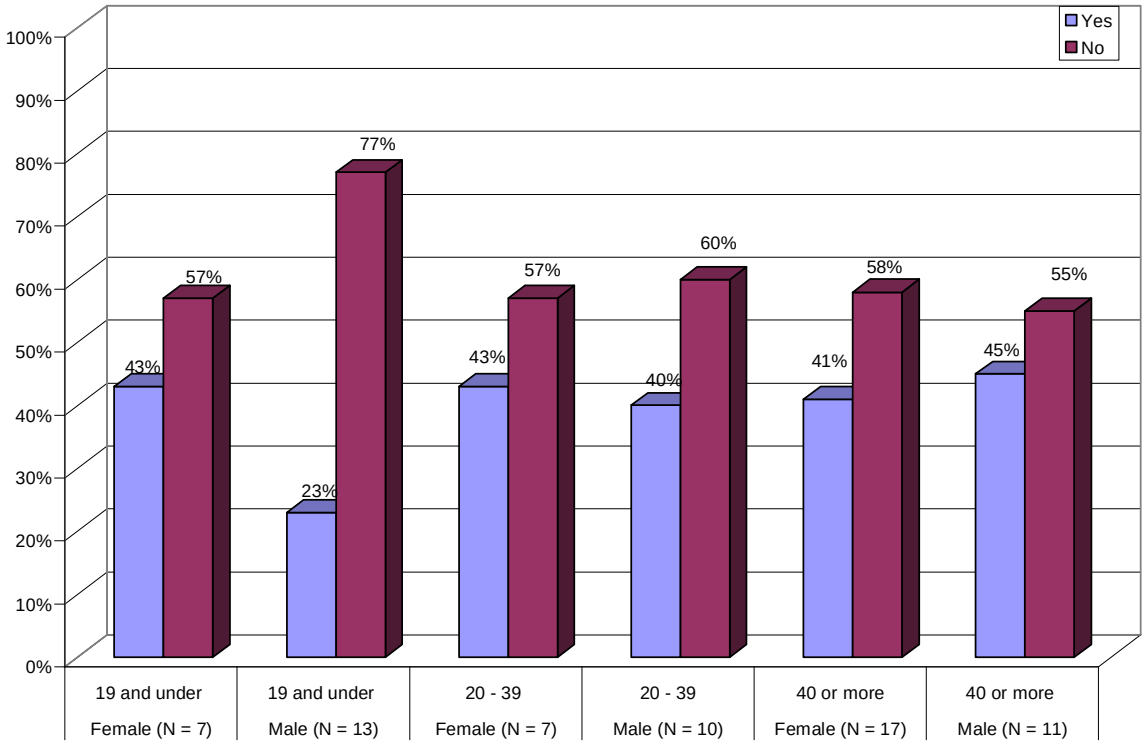


Table 2

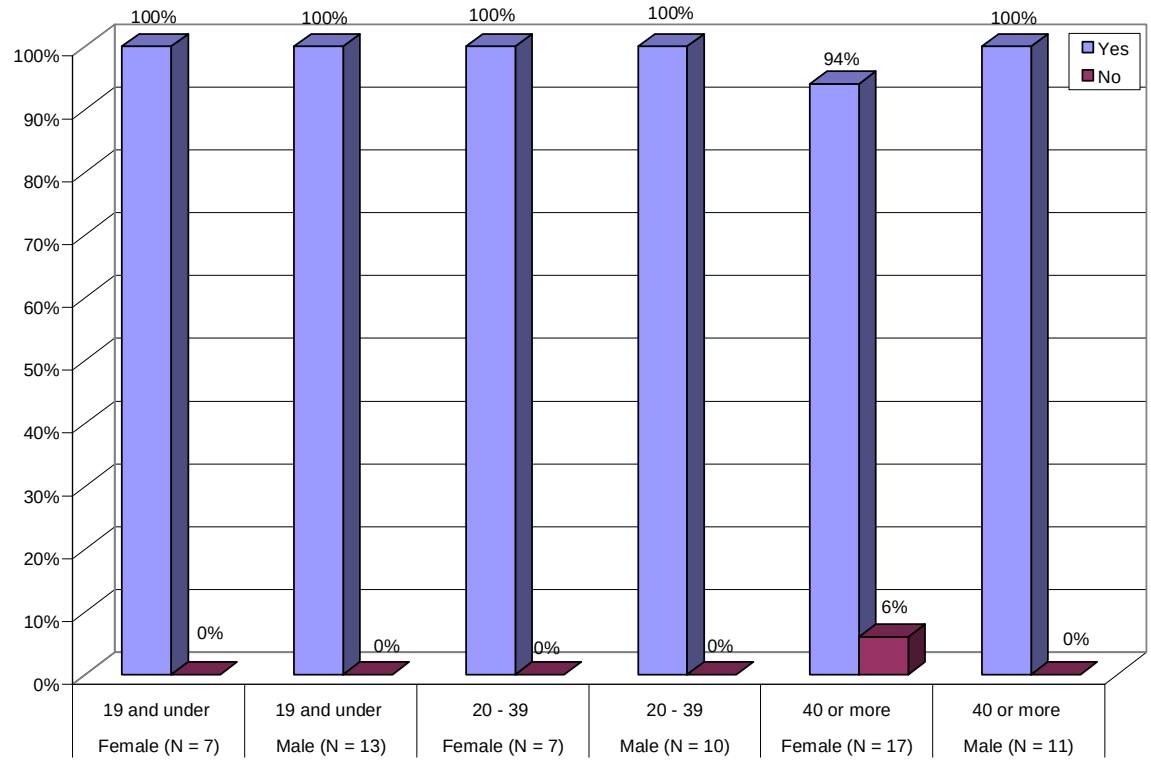
Visitor Reactions to Tornado Video Wall, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	07	
	Male	13	
Subtotal		20	(32)
20 – 39			
	Female	07	
	Male	10	
Subtotal		17	(23)
40 or More			
	Female	17	
	Male	11	
Subtotal		28	(45)
Total		65	(100)

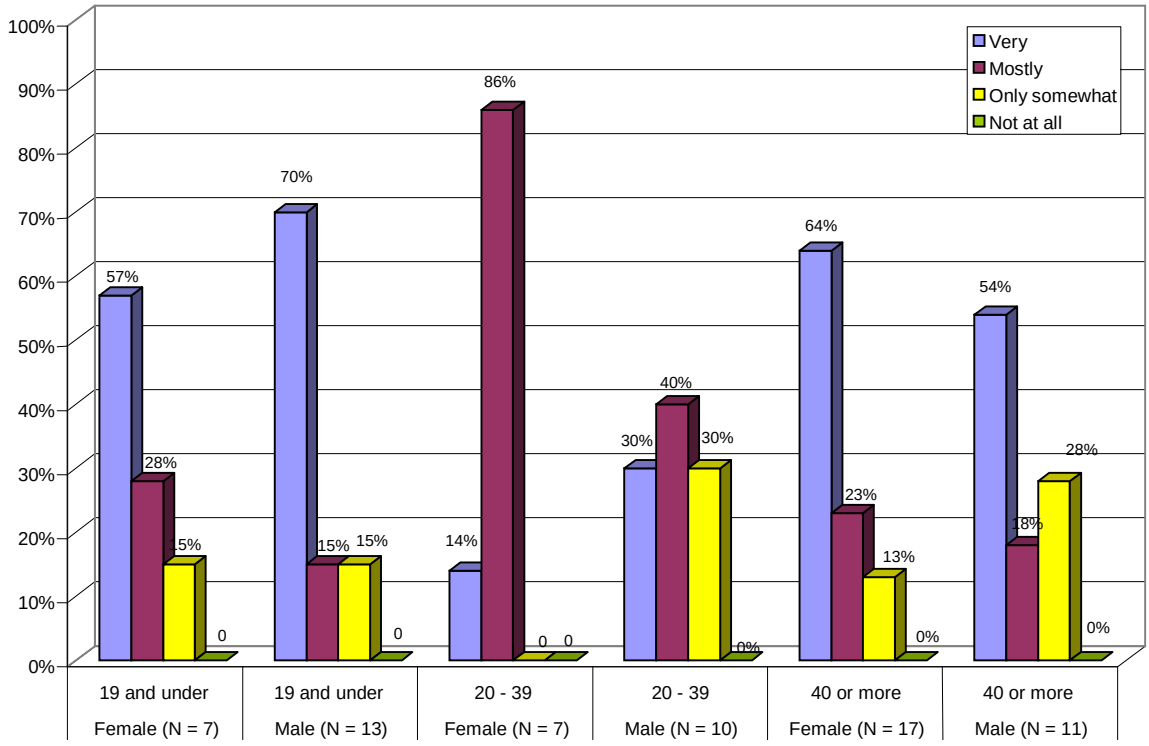
Tornado Video Wall
Figure 3. Has your neighborhood ever been threatened by a tornado?



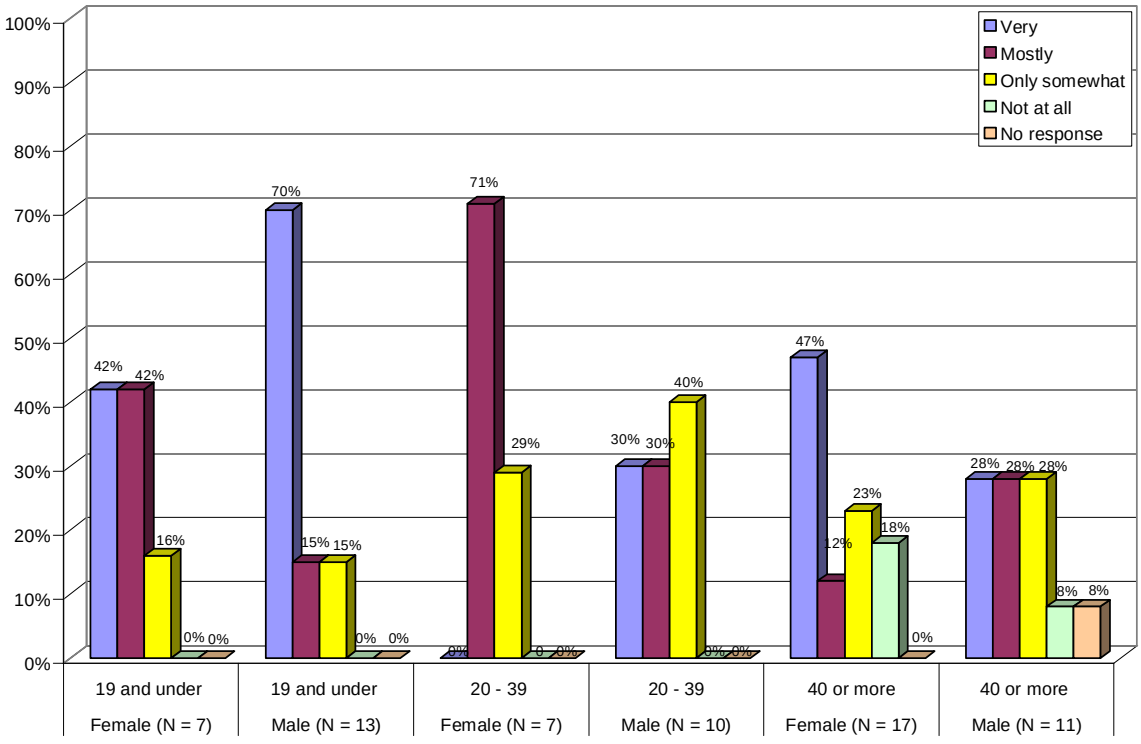
Tornado Video Wall
Figure 4. Did you find this exhibit easy to understand and operate?



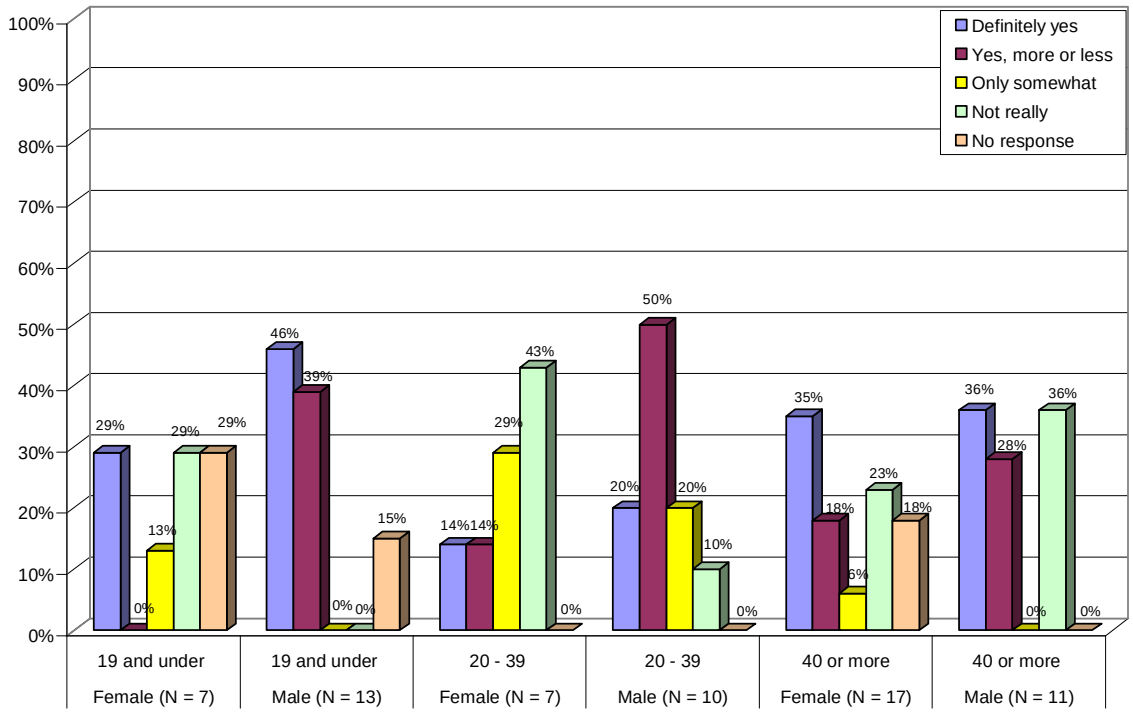
Tornado Video Wall
Figure 5. Did you find this exhibit interesting?



Tornado Video Wall
Figure 6. Did you find this exhibit informative?



Tornado Video Wall
Figure 7. Based on your experience with this exhibit, do you have a better understanding of how tornadoes form?



Tornado Video Wall
Figure 8. Does this experience make you want to learn more about the science underlying the prediction of tornadoes?

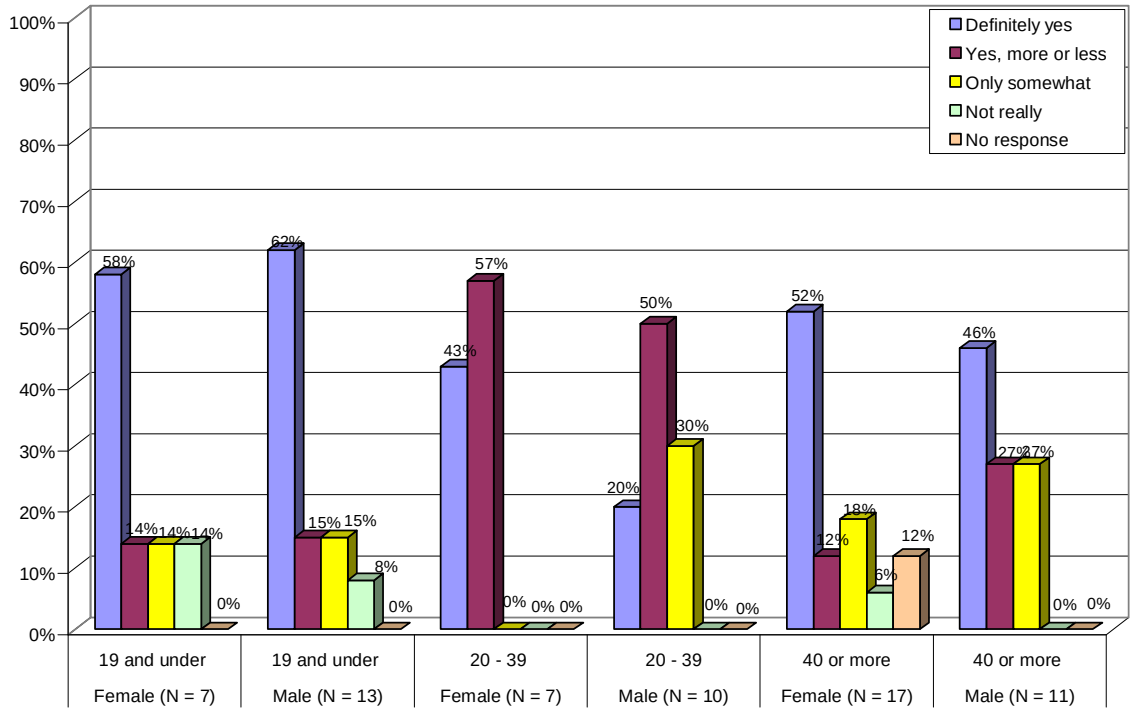


Table 3

What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• More information on #2 and #8 about how tornadoes form. • Add noise
	Male	• Too light, need to darken so the sun's rays are less of a problem. • Captions under each screen/ location and year of tornado • Add sound effects • Add sound
20 – 39		
	Female	• More information on what we are seeing • More facts, more interactivity • Use one big screen in middle, not multiple screens • Add audio • Have a solid middle screen
	Male	• One big screen, instead of multiple screens • #2 needs information along with it for fuller understanding of how tornadoes form • Have a solid video wall • I like the computer simulation model • Add audio. Add narrative explanation • Have one solid monitor rather than 16 • Add audio. Add narrative
40 or More		
	Female	• We know all about tornadoes • It is good for the children to learn about the tornado and how to protect themselves • Put a sign on the water spout that it is just for observation • Needs text "captions' under each screen. Needs stages identified as tornadoes build • Neat pictures • He likes to know "why," how things work. He is very curious about this. • More textual or audio information • Add explanatory text for audio • Very easy to use • Add text information. Images are blurry up close. • More dramatic images. Add explanations
	Male	• Picture clarity is a problem • Add audio like a message • Poor resolution of pictures • No explanation behind visuals • I like all the screens that show different areas of the country • Very scary • We know all about tornados • More dramatics images. Add explanations

Visitor Reactions to *Disasterville's* Hurricane Booth

Introduction

Visitors exiting the Hurricane Booth in *Disasterville* were interviewed by the evaluators about their reactions to the exhibit. The interview protocol consisted of three demographic questions, and eight questions probing the visitors' perceptions of their experience with the Hurricane Booth. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 52 visitors varying in age and gender were interviewed. The interviews were limited to those who entered the exhibit; those who only observed were not interviewed. The data were collected between November 18 and December 10, 2006.

The Hurricane Booth is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It provides visitors the opportunity to experience minimal hurricane force winds in a protected and contained environment. The booth can comfortably hold two adults or about three children, standing upright. The chamber is transparent, allowing those inside to see out and those outside to see in. The booth activates automatically when its door is closed and deactivates automatically should its door be prematurely opened. The full wind experience lasts just under one minute.

Summary of Results

When asked if they had ever experienced a hurricane first hand, 50% or more of the interviewees in each age by gender grouping responded "yes". This is no doubt a reflection of the large number of storms that struck the state within the last three years (Figure 9). The interviewees were asked if they were a little nervous before entering and while inside the Hurricane Booth. The results varied somewhat by both age and gender. A majority of females

and males 19 and under, as well as males 40 or more, admitted to being a bit nervous before entering the booth; a noticeable percentage of females 40 or more also expressed the same feeling. However, almost no one among the 20 to 39 interviewees, female or male, said that they were nervous before entering (Figure 10). As indicated by the results in Figure 11, feelings of nervousness tended to decline among many interviewees once inside the exhibit. The only exception--the percentage of females 20 to 39 expressing nervousness while inside was actually higher than the percentage expressing nervousness before entry. From the results of Figure 12, it is clear that the majority of interviewees in each age by gender grouping found the experience "very" or "mostly" exciting. It is also clear that the excitement was experienced by a larger percentage of the younger interviewees than the older interviewees. Asked if they found the experience stimulating, a majority of interviewees in each age by gender grouping except females 19 and under indicated that they found it "very" or "mostly" stimulating (Figure 13). When asked if they were surprised by the amount of force exerted by the wind, most of the female and male 19 and under respondents, as well as the female 20 to 39 respondents indicated being very surprised. The adult males and females 40 or more appeared less surprised (Figure 14). Asked if there was anything about the experience that they didn't expect, many of the respondents said they were surprised by the loud noise of the exhibit or the simulated lightning flashes (Table 5).

Learning and Perceptions

The interviewees were asked, "Based on this experience, do you have a greater appreciation for the potentially destructive force of a hurricane?" A majority of the female interviewees in all three age groupings responded "definitely yes". A majority of males 19 and under also responded "definitely yes". The adult males were less affirmative, although even among them about half said "definitely yes" or "yes, more or less" in response to the question

(Figure 15). Asked if the experience made them want to learn more about how to protect themselves in the event of a hurricane, the interviewees differed in their response depending upon age. The responses from those interviewees 19 and under were highly affirmative. The responses from the adult interviewees were somewhat less so. Females 40 or more were highly split on the question; they responded either "definitely yes" or "not really (Figure 16).

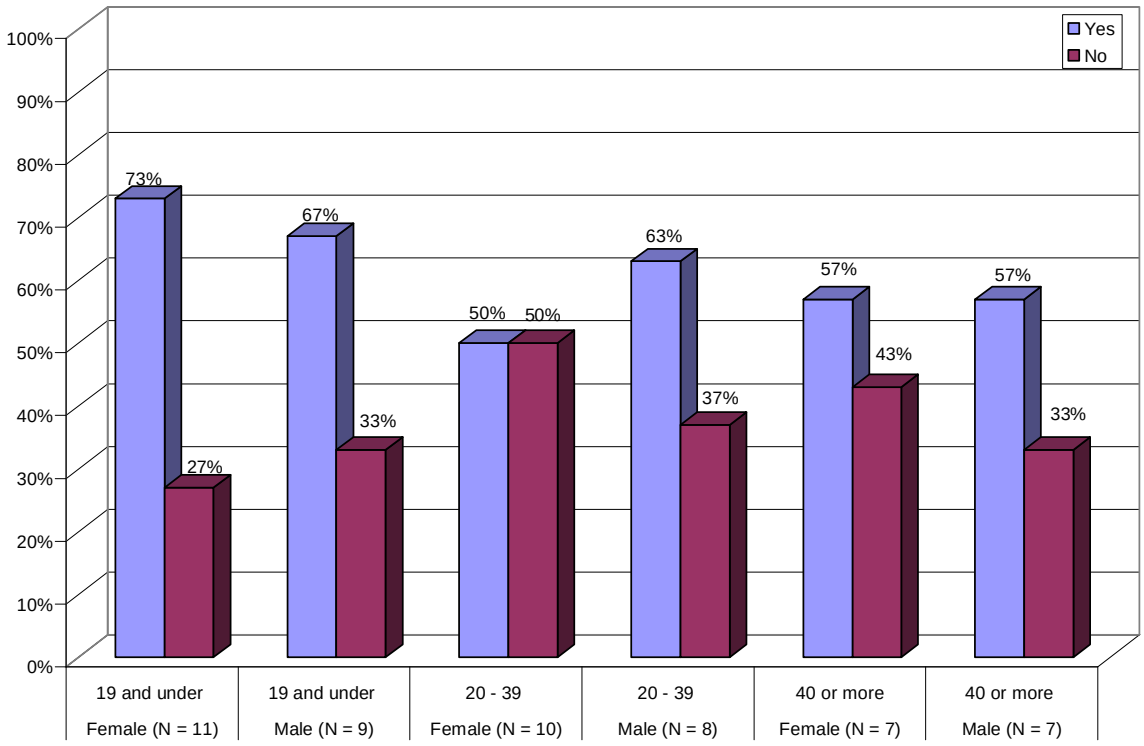
Hurricane Booth Tables and Figures

Table 4

Visitor Reactions to Hurricane Booth, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	11	
	Male	09	
Subtotal		20	(38)
20 – 39			
	Female	10	
	Male	08	
Subtotal		18	(35)
40 or More			
	Female	07	
	Male	07	
Subtotal		14	(27)
Total		52	(100)

Hurricane Booth
Figure 9. Have you ever experienced a hurricane first hand?



Hurricane Booth
Figure 10. Were you a little nervous just before entering the booth?

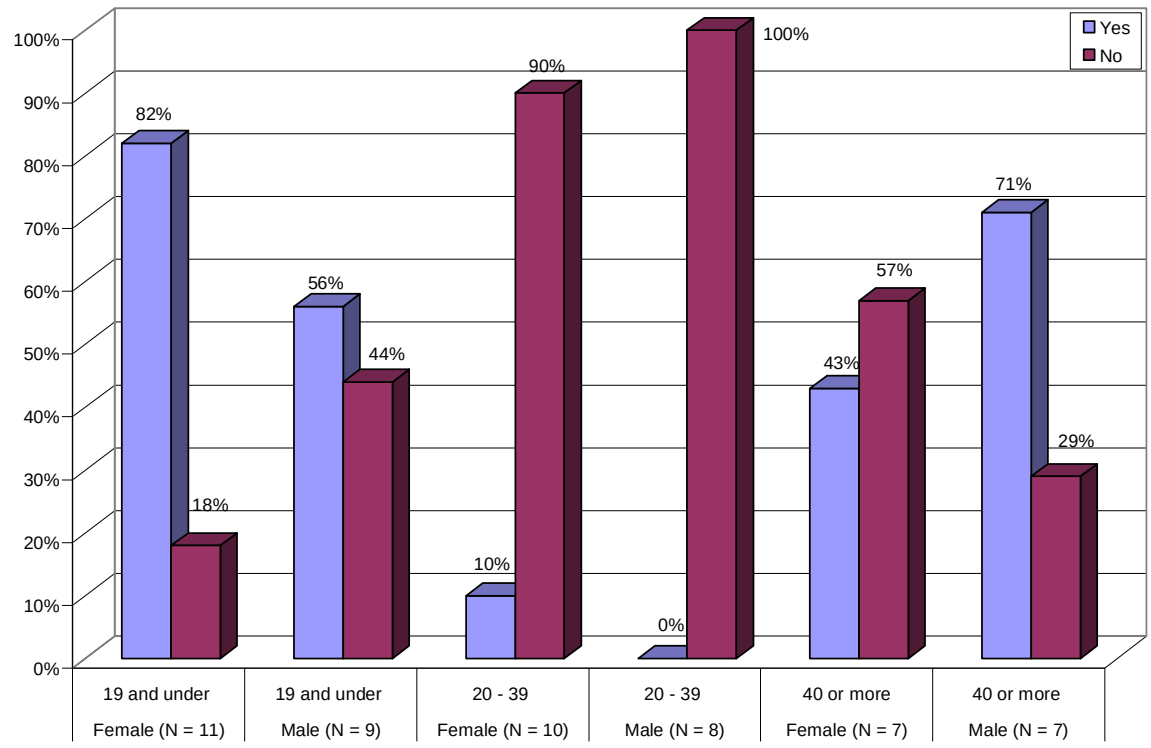
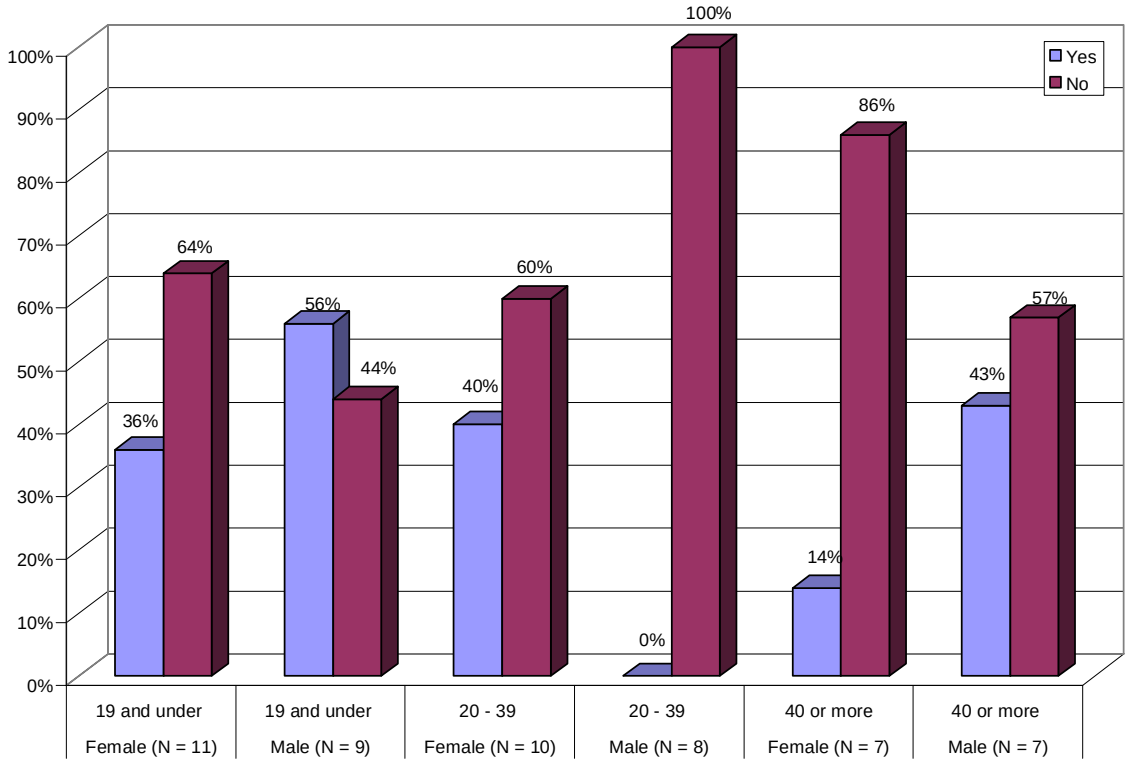
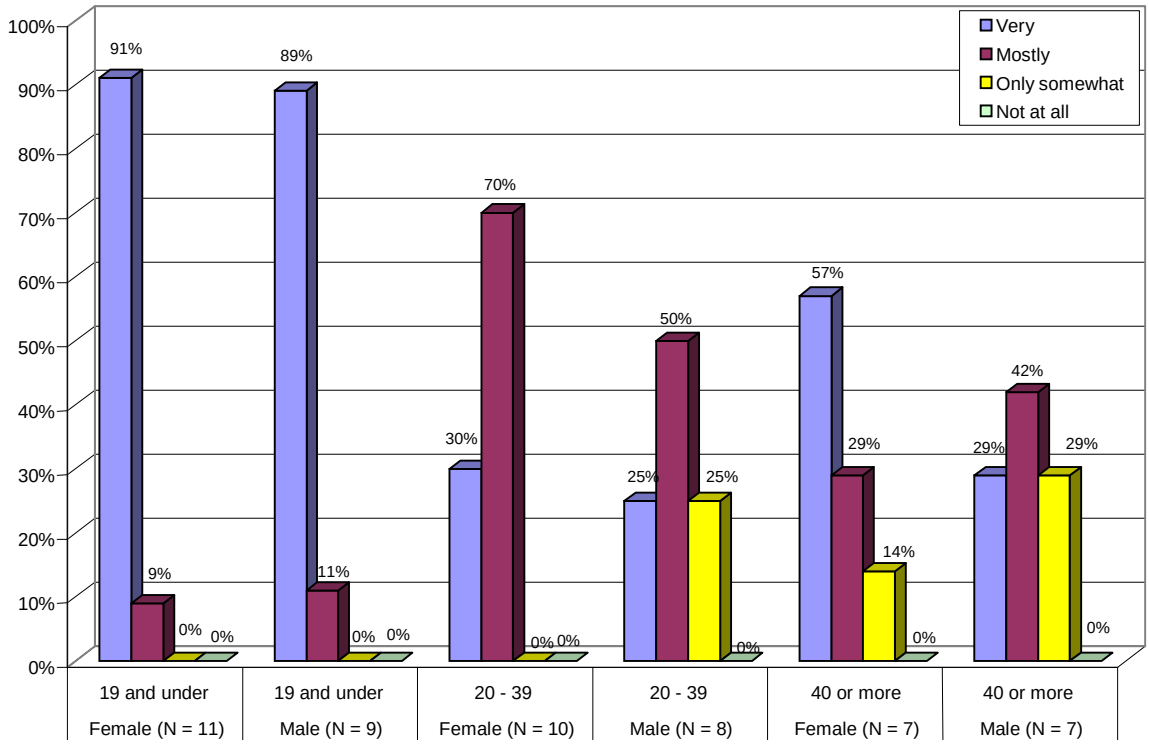


Figure 11. Were you nervous while inside?

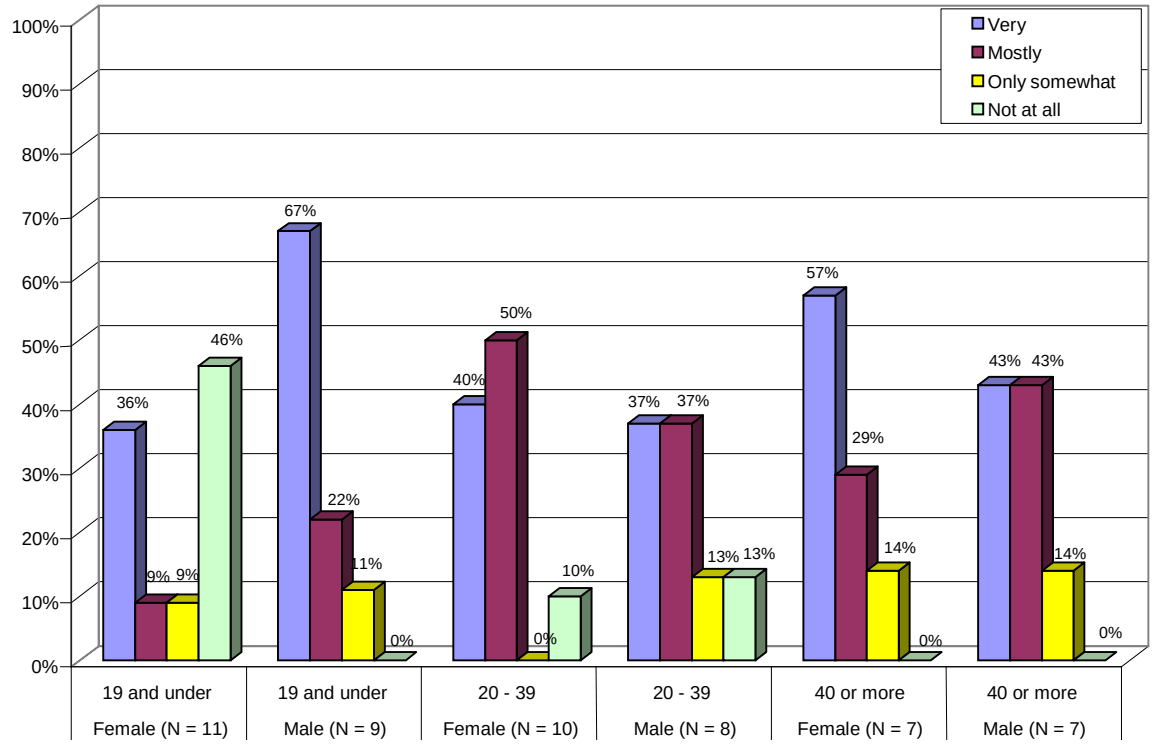


Hurricane Booth

Figure 12. Did you find the experience exciting?



Hurricane Booth
Figure 13. Did you find the experience stimulating?



Hurricane Booth
Figure 14. Were you surprised by the amount of force exerted by 75 mph winds?

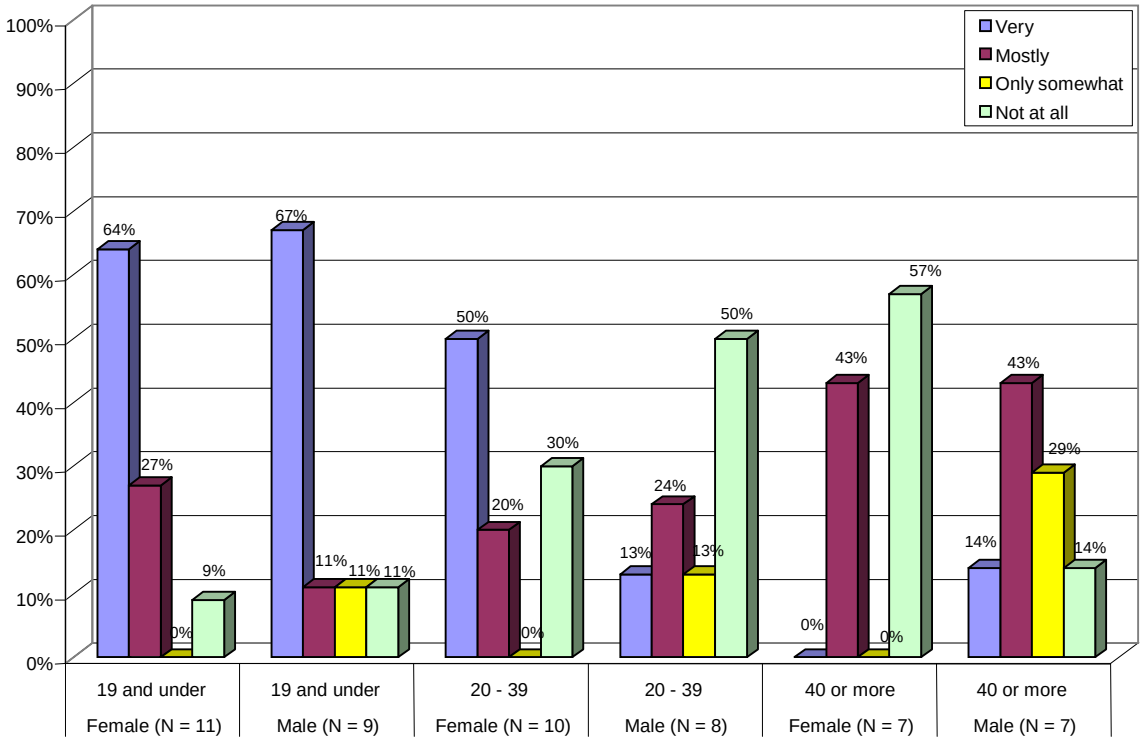


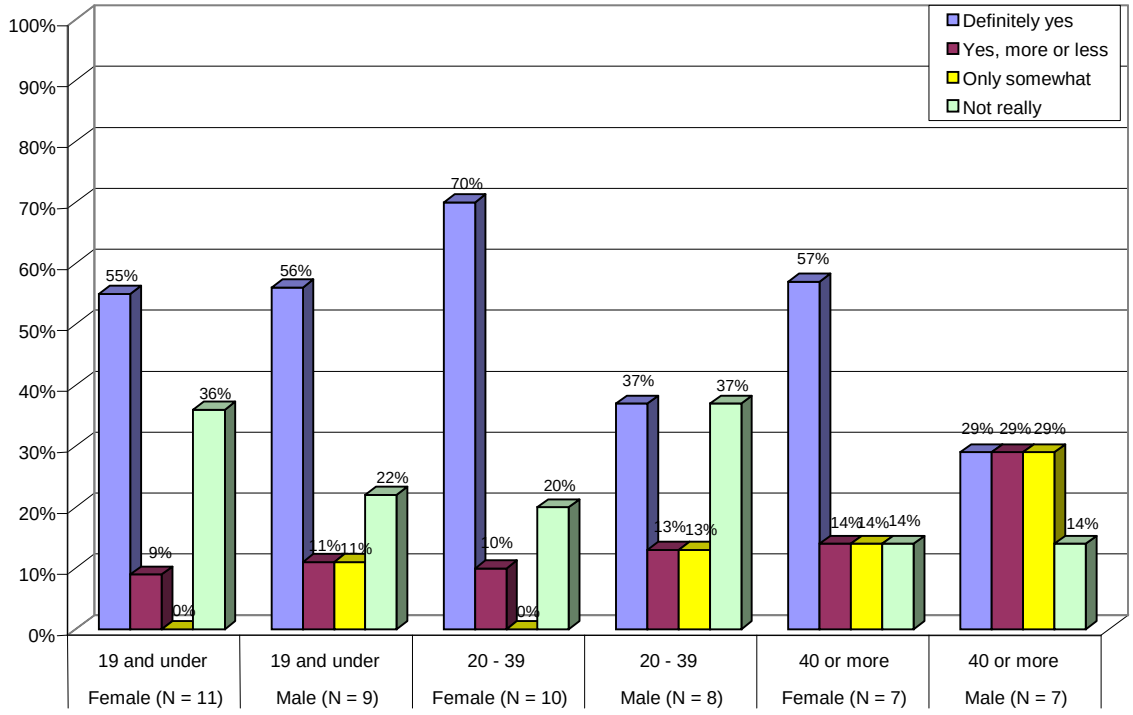
Table 5

Was there anything about the experience that you didn't expect?

Age	Gender	
19 and Under		
	Female	• Not that bad – really windy • Thunder • Other noises (rain) • How hard wind can blow. • Lightning • Other noises • Other noises • Loud noise
	Male	• Didn't expect it to be so weak • Lightning • Lightning • Noise • Lightning • Lightning flashes • Everything
20 – 39		
	Female	• Force of wind – warmth • Hurt eyes • Lightning • Not quite that strong • Breathing hard
	Male	• Loud noise • Loud • Heat • Eyes hurt • Entrance was tight to get in and out
40 or More		
	Female	• My hair didn't move • The lightning • No surprises
	Male	• Noise • The thunder • Didn't feel as forceful as I expected • No force around my legs • The force of the wind

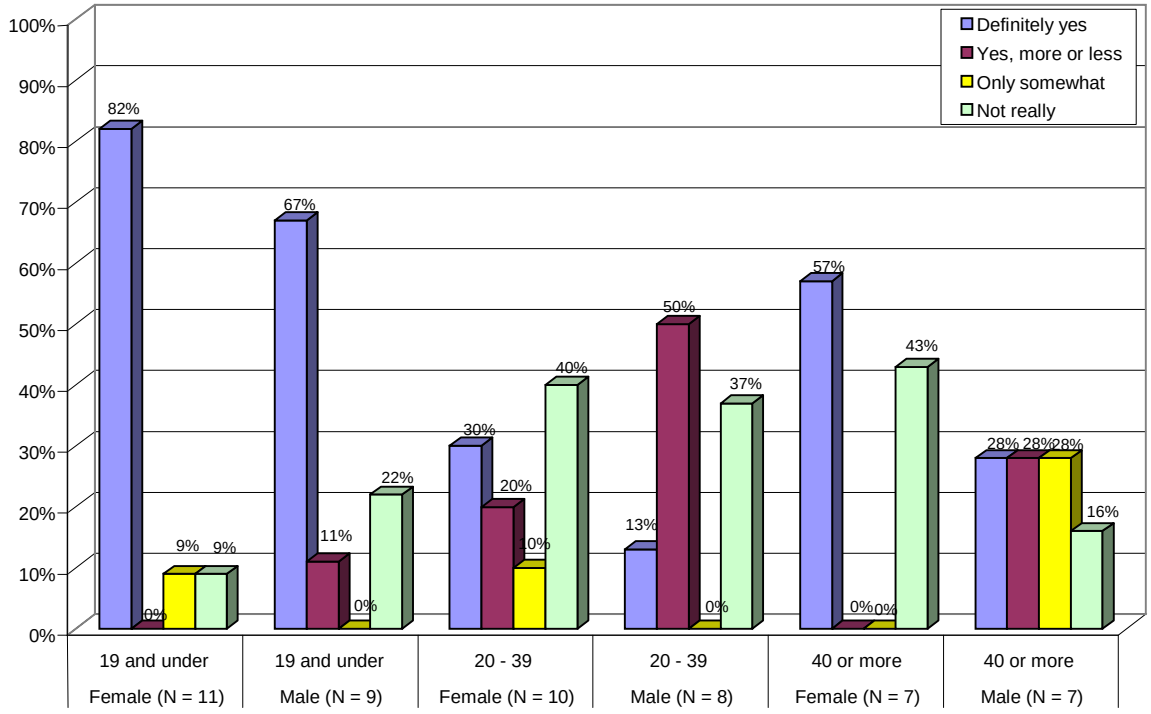
Hurricane Booth

Figure 15. Based on this experience, do you have a greater appreciation for the potentially destructive force of a hurricane?



Hurricane Booth

Figure 16. Does this experience make you want to learn more about how to protect yourself in the event of a hurricane?



Visitor Reactions to *Disasterville*'s Hurricane Hunter

Introduction

Visitors to the Hurricane Hunter Exhibit in *Disasterville* were observed and interviewed by the evaluators regarding their experience with the exhibit. A combined observation and interview protocol was used to unobtrusively observe visitors' duration of engagement with the exhibit and inquire about visitors' perceptions of their experience. The protocol allowed visitors to rate whether or not the exhibit appealed to them, and to explain their rating; the typical interview was completed in less than 30 seconds. A total of 88 visitors varying in age and gender were observed at the exhibit, and a total of 72 visitors varying in age and gender were interviewed. The data were collected between December 10 and 20, 2006.

The Hurricane Hunter exhibit is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It consists of the cockpit and forward portion of an aircraft with a doorway cut into its side for easy entry. Video screens have replaced the windows in the cockpit, and these videos show continuously an aerial view of hurricane cloud formations. The exhibit can accommodate several visitors at a time.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of visitor engagement with the Hurricane Hunter exhibit was relatively brief, seldom lasting more than 30 seconds. Females in the 19 and under and 20 - 39 age groupings appeared to spend the least amount of time with the exhibit, often just ducking in for a few seconds (Figure 17).

Ratings

When presented with a three-point scale asking whether the exhibit appealed to them (yes, somewhat, no), visitors in the 19 and under and 40 or more age groupings gave largely

dichotomous responses, answering either "yes" or "no". While a sizable percentage of respondents in each of the three age categories were negative toward the exhibit, none were more negative than females 20 to 39 (Figure 18). Those who found the exhibit appealing generally offered one of two explanations for their response: They liked seeing a hurricane from above, or they enjoyed the feel of being in an airplane (Table 7). Those who found the exhibit unappealing (Table 8) typically cited the lack of an interactive dimension or the lack of audio (e.g., "There's nothing to move or manipulate"). When asked, "What changes would make the Hurricane Hunter exhibit more interesting or informative?" the most frequent suggestions were the following: Add interactives, add audio, install larger video screens, add seats, and add signage that explains what is going on (Table 9).

Hurricane Hunter Tables and Figures

Table 6

Number of Observations for Hurricane Hunter, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	17	
	Male	23	
Subtotal		40	(45)
20 – 39			
	Female	12	
	Male	10	
Subtotal		22	(25)
40 or More			
	Female	11	
	Male	15	
Subtotal		26	(30)
Total		88	(100)

Figure 17. Duration of Engagement for Hurricane Hunter by Gender and Approximate Age

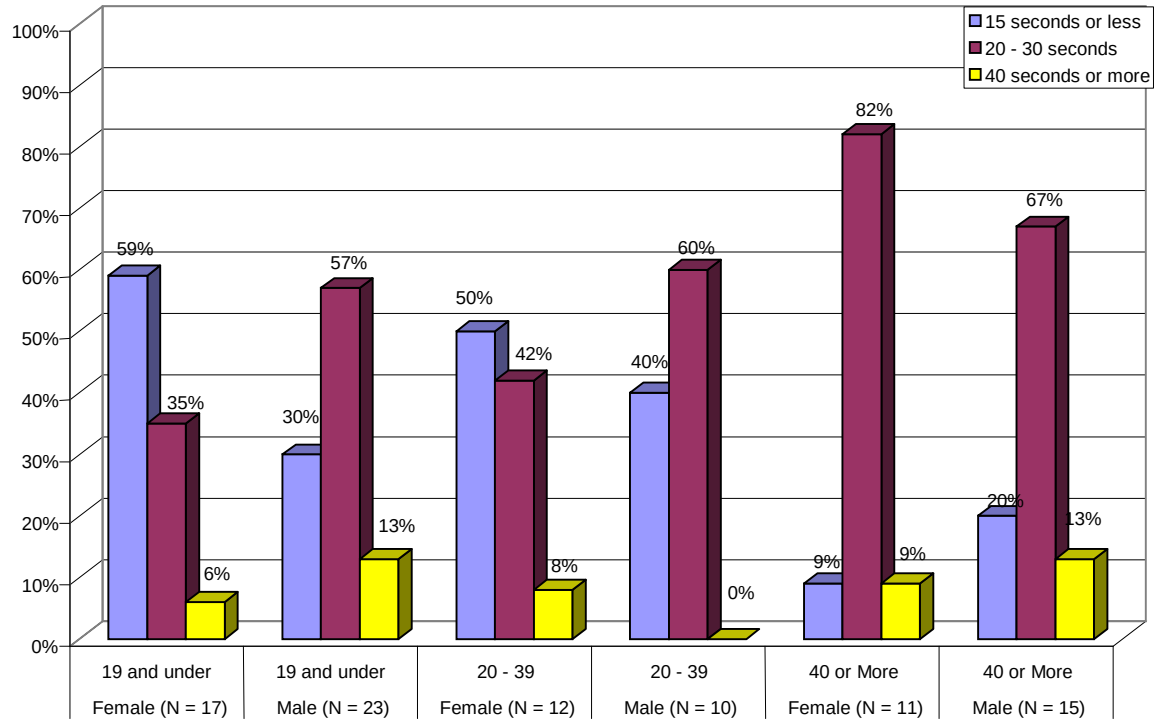


Figure 18. Did the Hurricane Hunter Exhibit Appeal to You? (by Gender and Approximate Age)

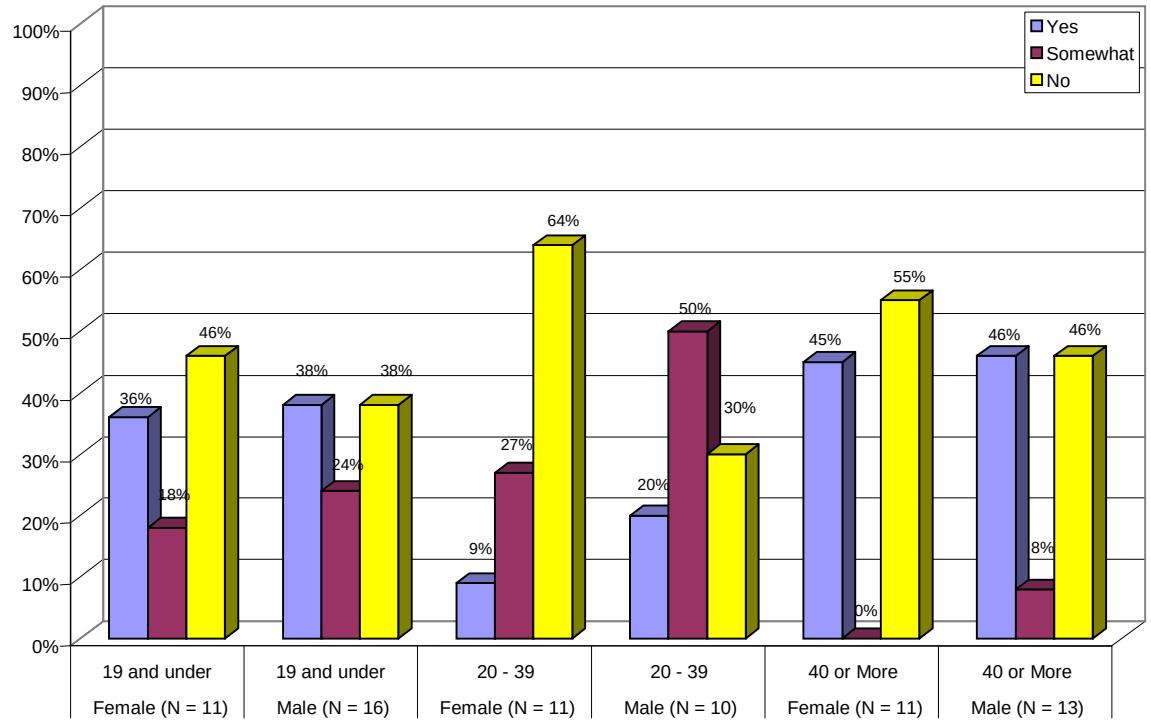


Table 7

If Hurricane Hunter Exhibit Appealed to You, What was Most Appealing?

Age	Gender	
19 and Under		
	Female	• You get to see what the cockpit of the plane looks like. • How dark it was inside • It was like you were actually flying in an airplane • It make you feel like you are in an airplane • I like looking at the weather
	Male	• It shows what the ocean looks like from the air • Its dark inside • I liked the videos • Cool looking down on the water • I could see the storm • I like being in an airplane
20 - 39		
	Female	• Cool to see what the pilot sees • I like seeing what the inside of a hurricane looks like
	Male	• Very educational • The shape of it
40 or More		
	Female	• I like the videos • Looks authentic • Feels like you are in a hurricane hunter • To see what it's like above a hurricane
	Male	• It's cool, showing how you fly threw a hurricane • I like seeing the hurricane winds on the ocean • Simulating weather during hurricanes • The view from the plane • To see what its like above a hurricane • The screens make it seem like you are in an airplane • I liked the video

Table 8

If Hurricane Hunter Exhibit Did Not Appeal to You, What was Not Appealing?

Age	Gender	
19 and Under		
	Female	
		• It wasn't very exciting • No sound, nothing but video • Nothing moves • It's not really doing anything • There is nothing to move or manipulate
	Male	
		• It just showed a video • It's just videos • No seats, no noise • I don't get it. What's the purpose? • There's nothing to move or manipulate
20 - 39		
	Female	
		• Doesn't say what it is • No interactives • I don't know what it is • Needs to be jazzed up – more controls, like a real cockpit • Nothing interactive in there • Doesn't do anything • It lacks instructions
	Male	
		• Didn't catch my attention. • I don't get it – nothing to it • It's like a tomb in there
40 or More		
	Female	
		• Don't know what the purpose is • It just has pictures • Wasn't much to it • No explanation/audio to tell us what is going on
	Male	• It's like sitting at home and watching TV • What is it supposed to represent? • Didn't know what it is about • Don't know what it is suppose to be doing • There is no explanation to tell us what is going on

What Changes Would Make the Hurricane Hunter Exhibit More Interesting or Informative?

Age	Gender	
19 and Under		
	Female	• Add controls to make it realistic • Add somewhere to sit • Add controls • It has no interactives • Add controls • Add sound • Add interactives • Put some controls in it • Add manipulatives to make it more interesting
	Male	• Add buttons and stuff to push • Make the videos less blurry • Add a seat • Add something besides videos • Put in bigger video screens and a place to sit • Add seats; add sound • Add seats • Add knobs that you can work
20 – 39		
	Female	• Add some interactives • Add something so we know what it's about • More controls, as in a real cockpit • Add interactives • It needs to do something other than just show videos • Add instructions
	Male	• Add more screens • Not very realistic as is • Add a sign that tells what you're suppose to be seeing • Add seating • Put larger screens in it • Add explanation so that we would know where we are flying • Add larger screens • Make it more realistic/more like a flight simulator • Add audio, describing flight and what pilots are looking for
40 or More		
	Female	• Add Audio • Add sound and lighting • Add interactives • Make a ride out of it • Add audio that explains what is going on
	Male	• Have an explanation of what the exhibit is suppose to be • Make it more interactive • Add controls • Put in bigger screens • Add sound and more lighting • Needs to be interactive • Add controls • Label it to tell what it is • Make it feel like you are in the cockpit of a real airplane • Add an explanation to tell what is happening

Visitor Reactions to *Disasterville*'s Three Little Pigs Exhibit

Introduction

Visitors to either of two tables comprising the Three Little Pigs Exhibit in *Disasterville* were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 101 visitors varying in age and gender were observed at the exhibit, and a total of 54 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who fully engaged the exhibit or observed someone fully engaging the exhibit. The data were collected between November 21 and December 2, 2006.

The Three Little Pigs exhibit is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It provides visitors the opportunity to construct simple structures out of small blocks of varying shapes, and activate a strong jet of air to observe how the constructions stand up under the blast of air. Signage over the exhibit area asks, "Can you build a house strong enough to stop the big, bad weather wolf from blowing it down?" The exhibit is comprised of two elongated tables, each with a cubicle at one end containing assorted blocks, and at the other end, an air jet that directs a strong stream of air down the length of the table when a button is held down. One table stands about 25 inches above the museum floor, and the other stands about 35 inches above the floor. Each table can accommodate several visitors at a time.

Summary of Results

Observations

As shown in Figure 19, visitor observations revealed for the youngest age grouping (19 years and under), the majority of both males and females spent 60 seconds or more engaging the exhibit. For the 20 - 39 years age grouping, a gender difference was seen between the male and female engagement observations - most females spent 60 seconds or more with the exhibit, while the majority of males spent 20 seconds or less with the exhibit. With the oldest age grouping (40 years or more), gender differences were observed between the male and female engagement - the majority of older males spent 60 seconds or more with the exhibit, while older females spent either 20 seconds or less (38%) or 30-50 seconds duration (also 38%). Figure 20 details the visitor actions by age and gender. "Full activation" of the exhibit was defined to include two consecutive behaviors: first, the person assembled the blocks, then activated the wind button to try to "blow the house down". The great majority of visitors in all three age groupings fully activated this exhibit; only minor gender and age differences were observed.

Interviews

A majority of interviewees by age and by gender reported having personal experience with either hurricanes or strong winds. Across all six age by gender categories, Figure 21 displays high affirmative response rates. Note that almost all adult males responded “yes.” When asked "Did you find this exhibit easy to understand and operate?" virtually all respondents across the six age by gender categories responded affirmatively (Figure 22). Figure 23 shows the responses to the item, "Did you find this exhibit fun?" Responses varied by both age and gender. Those in the youngest age grouping, 19 and under, were the most positive in their responses, fallowed by those in the 20 – 39 age grouping.

Learning and Perceptions

When asked what message they thought the Three Little Pigs exhibit is trying to get across, almost all of the interviewees identified the message as one of building strong houses to withstand strong winds (Table 12). When the interviewees were asked, "Does this exhibit make you curious about how strong winds can affect buildings and other structures"? their responses varied by age and gender (Figure 24). For both the 19 and under age grouping, and the 20- 39 age grouping, the most frequent response was "yes, more or less". Interestingly, the most positive response to the question came from females age 40 or more. Interviewees were also asked, "Does this experience make you want to learn more about how to protect against strong winds"? Within each age by gender grouping, the majority responded "definitely yes" or "yes, more or less". However as seen in Figure 25, this item also elicited a noticeable percentage of responses of "only somewhat" or “not really” from interviewees. In the 40 or more age grouping, a third of the males responded “not really” to the question. Asked “What changes, if any, would make the exhibit more enjoyable or more informative?” the interviewees offered various suggestions. The most frequent suggestion was to use blocks that were bigger, more numerous or in greater variety. Two other frequently occurring suggestions concerned providing instructions that clarify the purpose of the exhibit or that show how best to operate the exhibit, and strengthening the force of the wind (Table 13).

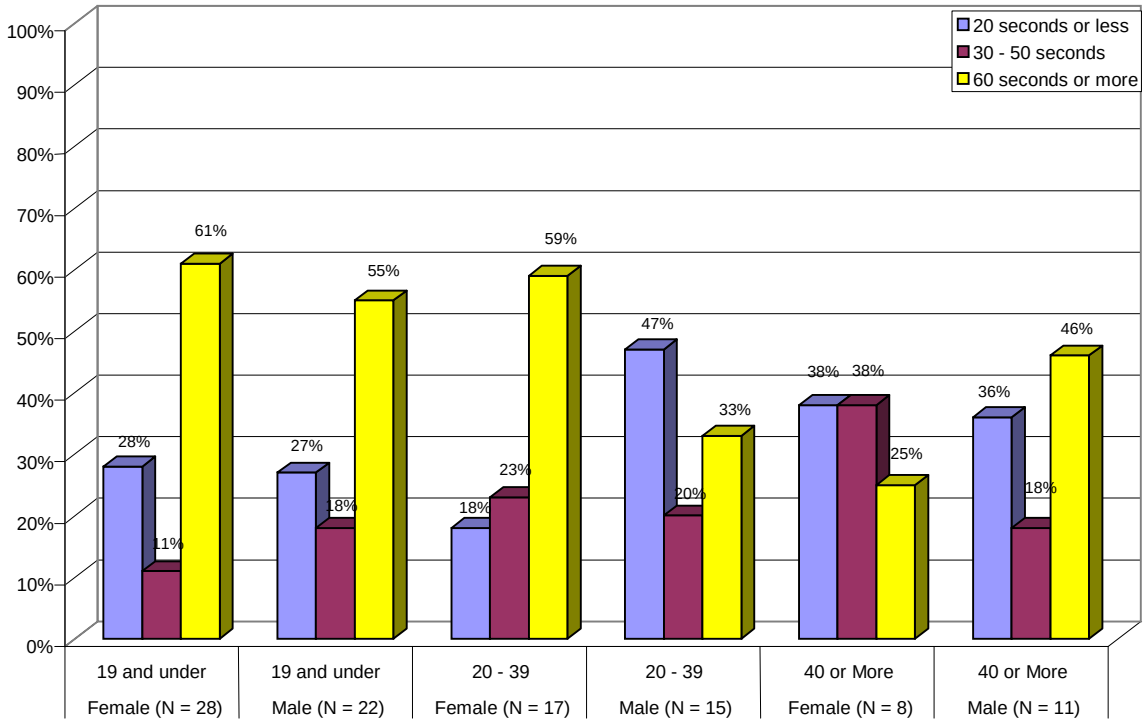
Three Little Pigs Tables and Figures

Table 10

Number of Observations for Three Little Pigs, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	28	
	Male	22	
Subtotal		50	(49)
20 – 39			
	Female	17	
	Male	15	
Subtotal		32	(32)
40 or More			
	Female	08	
	Male	11	
Subtotal		19	(19)
Total		101	(100)

Three Little Pigs
Figure 19. Duration of Engagement by Gender and Approximate Age



Three Little Pigs
Figure 20. Visitor Action by Gender and Approximate Age

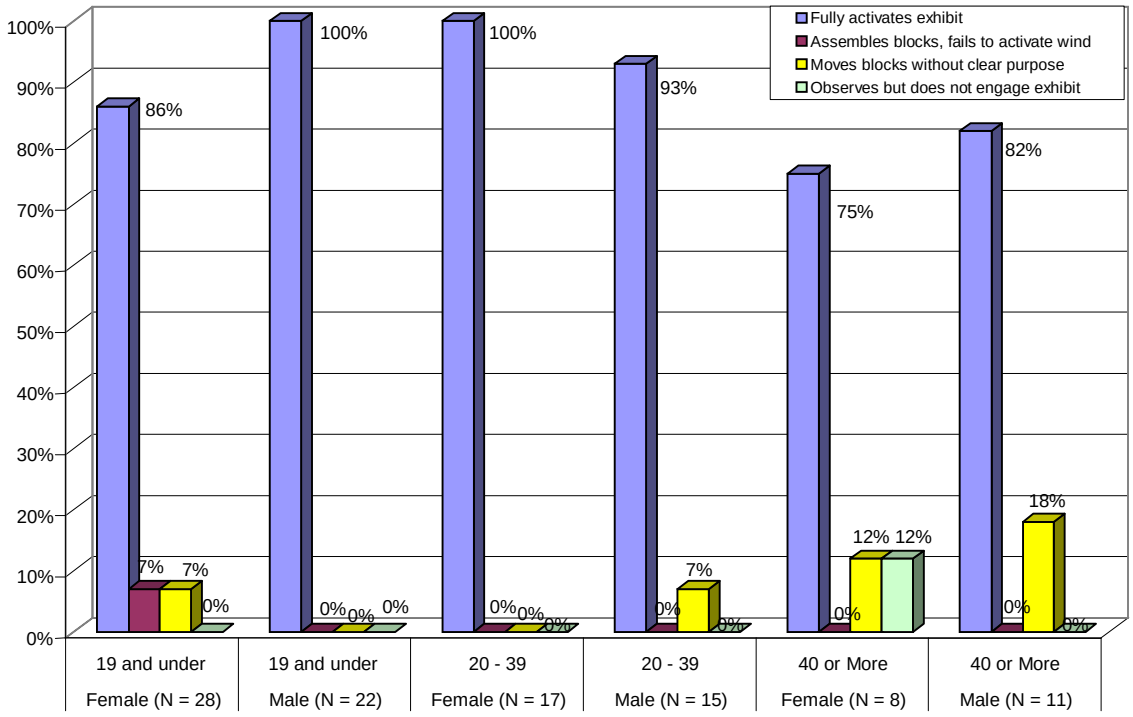
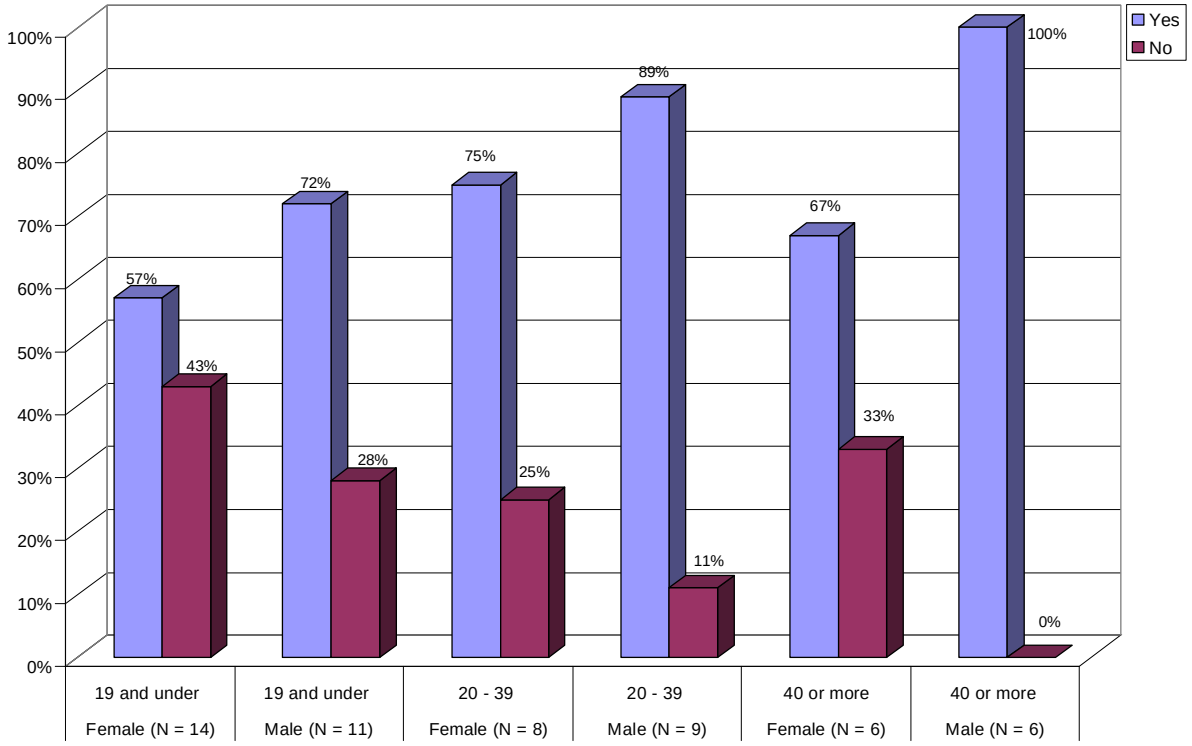


Table 11

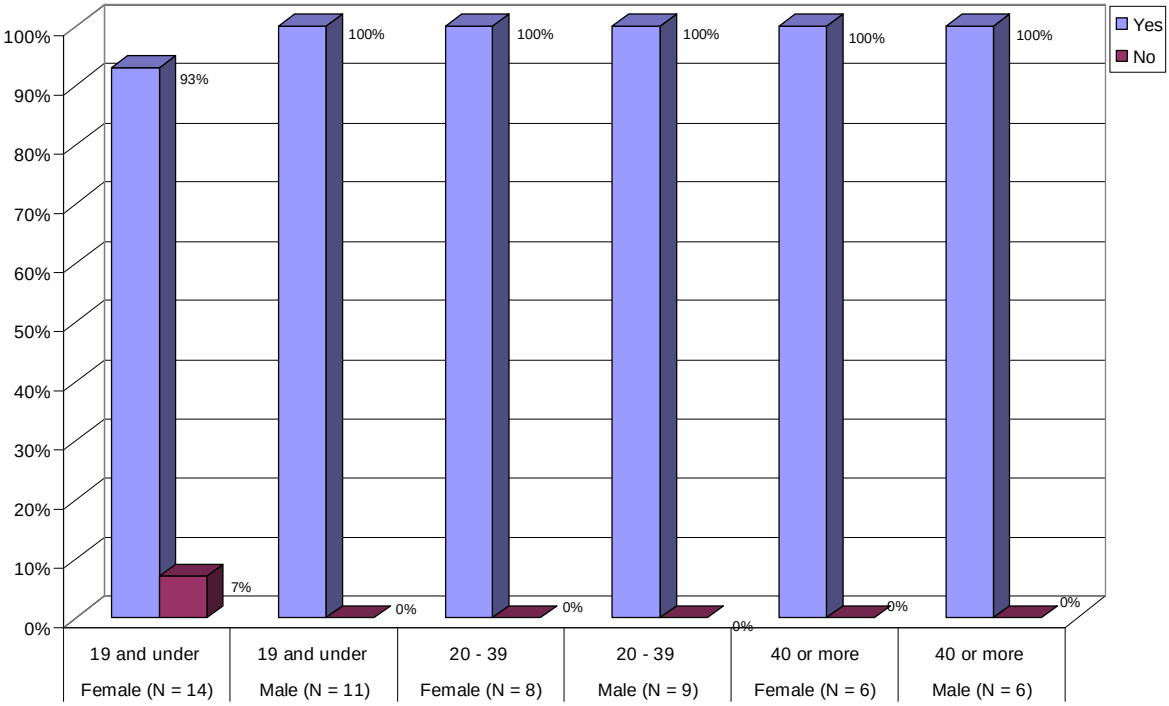
Visitor Reactions to Three Little Pigs, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	14	
	Male	11	
Subtotal		25	(46)
20 – 39			
	Female	08	
	Male	09	
Subtotal		17	(32)
40 or More			
	Female	06	
	Male	06	
Subtotal		12	(22)
Total		54	(100)

Three Little Pigs
Figure 21. Have you ever been in a hurricane or other strong wind?



Three Little Pigs
Figure 22. Did you find this exhibit easy to understand and operate?



Three Little Pigs
Figure 23. Did you find this exhibit fun?

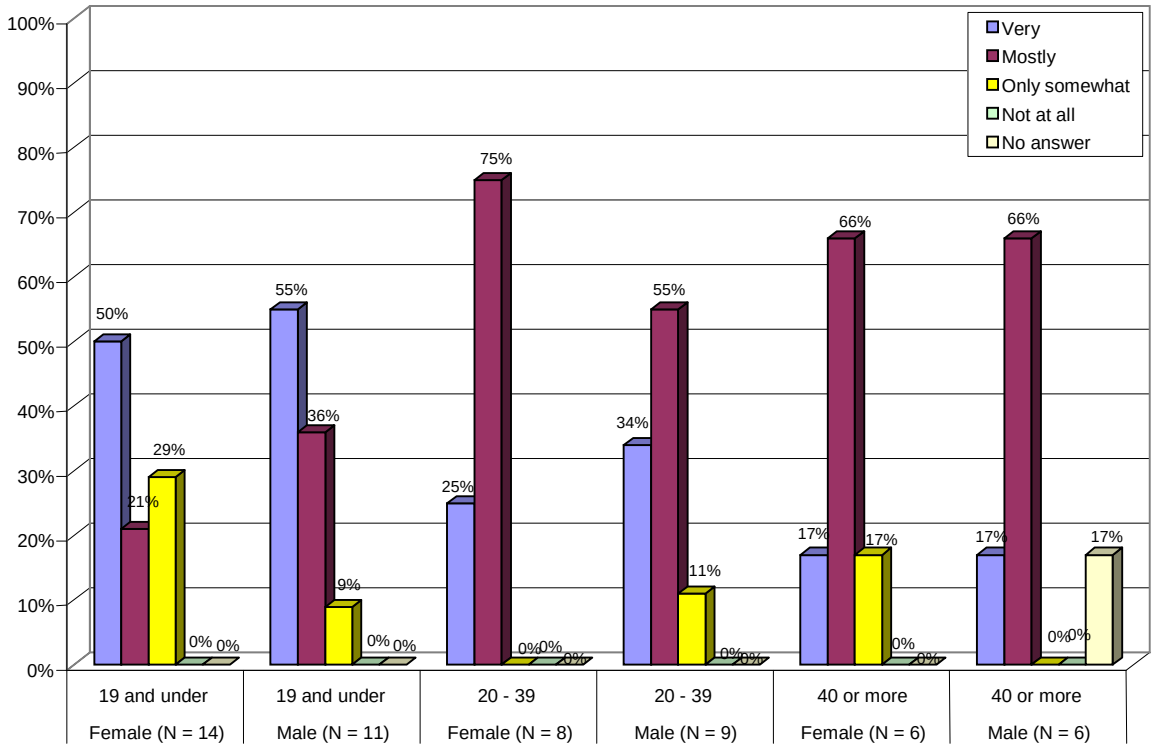


Table 12

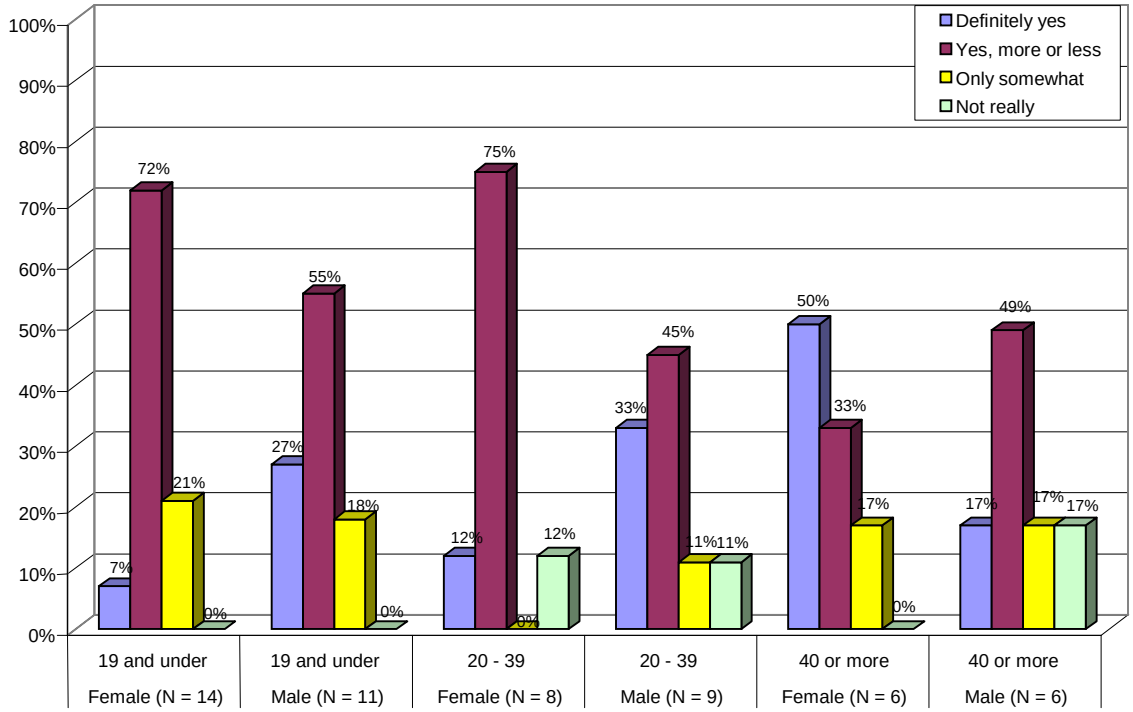
What message do you think this exhibit is trying to get across?

Age	Gender	
19 and Under		
	Female	• When hurricanes come, get low. • How to build sturdy foundation • Sturdy house are able to withstand stronger winds. • Build houses strong. • To have a strong house • The wind can be dangerous • Strength of wind • Hurricanes blow down weak houses. • Strong winds can destroy buildings. • The powerful winds can blow away houses. • How strong the wind can be.
	Male	• How to build strong foundations. • How buildings react to hurricanes • How to get strong buildings • How to build strong buildings • Big house are better than little ones in a storm • Strong winds blow houses down • To build a strong house • Strong winds blow down buildings • Even a strong structure would be blown over • Wind can be strong • We need better houses
20 – 39		
	Female	• The structure of the buildings • How strong your exterior is on your home. • How powerful hurricanes can be. • How you build your house affects how well it withstands strong winds. • How well a house can withstand wind. • Build against strong wind. • How strong winds can blow houses down. • How strong a house you can build
	Male	• The structure of buildings • Hurricanes are strong • One needs to build strong in hurricane areas • We need strong house to withstand hurricanes • Different structures react to different wind power • How powerful hurricanes can be. • Importance of construction to survive wind damage • Effects of wind on structures • How wind can affect structures.

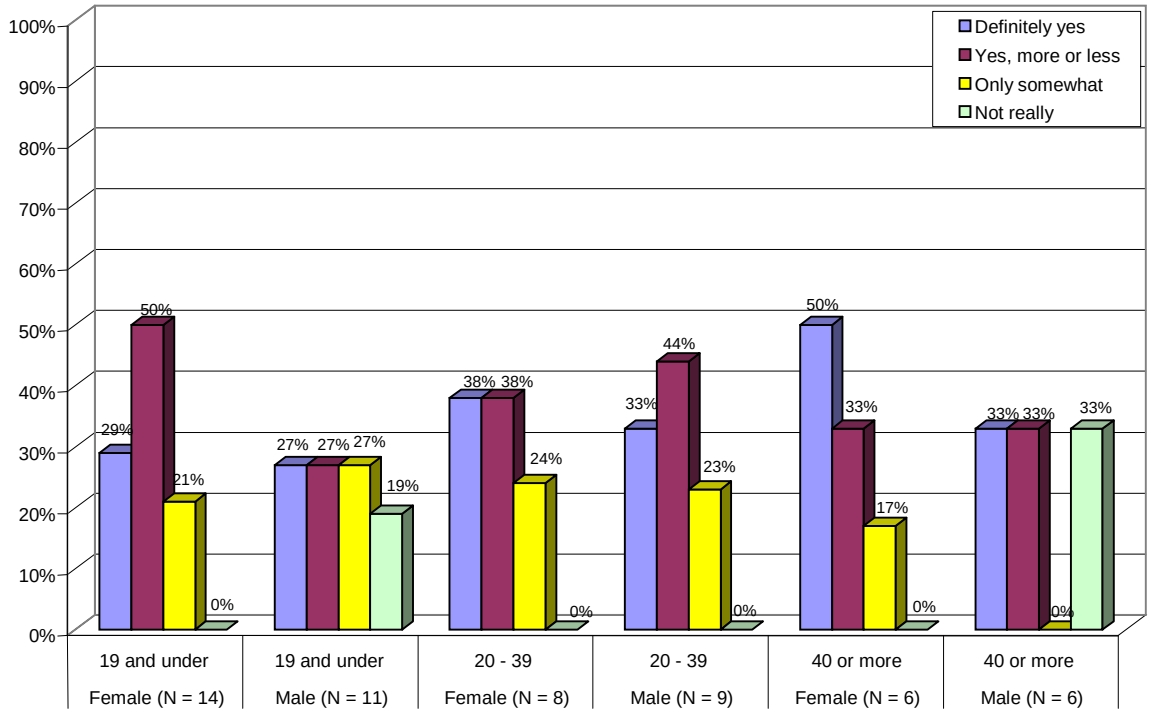
Table 12 (continued)

40 or More		
	Female	• Need a strong foundation on your house • The power of the wind • Bigger isn't always safer • How strong the wind is • Build a good house against wind • Not to take the wind lightly
	Male	• How structures hold up to the strong wind • The lower you are, the safer you are • Strong winds are dangerous • Force of winds • Consider hazards before you build. • Shows kids the power of wind

Three Little Pigs
Figure 24. Does this exhibit make you curious about how strong winds can affect buildings and other structures?



Three Little Pigs
Figure 25. Does this experience make you want to learn more about how to protect against strong winds?



What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• Bigger blocks • Use bigger stronger blocks • Use Lego, so they stay together • Put bigger blocks • Add more things to get blown around • Put in stronger wind • Make the wind stronger • Better explain what the red button and wind box does • Clarify the button, what it does • Explain what it showed when it would occur • More powerful wind. Bigger blocks and stuff • Better building material • Have different materials to build the house
	Male	• Use Lego blocks, so they stay together • Make blocks stronger • Make wind stronger; use Lego pieces so they don't fly all over the place • Put a lot more wind • Make wind stronger • Make the wind huge • More pieces • More instructions
20 – 39		
	Female	• Add more blocks so you could build several houses at the same time and see the affects on them • Instructions need to be better/clearer. Follow up with information • The wind jet is too high to knock down the lower blocks • Add more blocks
	Male	• Add an indication on the knob of how strong the wind is • Make blocks heavier • More information on winds and their effect. • Allow for greater variety in housing components. • A few more blocks • More information on what do you do with it: Pamphlets, web sites
40 or More		
	Female	• Connect blocks or other materials • More wind from different angles • Have examples for them to see before they build • Bigger blocks and have wind source higher on wall
	Male	• Add a backstop to keep blocks from blowing onto the floor • Add more than blocks to exhibit. • Use different shapes to see how wind reacts to different types of buildings • Tie down code reinforcing, for kids to see damage • Different types of blocks – Lego type

Visitor Reactions to *Disasterville's* Hurricane Game/Flash Information Kiosk

Introduction

Visitors to the Hurricane Game/Flash Information kiosk in Disasterville were observed and interviewed by the evaluators regarding their experience with the interactive display. An observation protocol was used to unobtrusively observe visitor engagement with the kiosk and the duration of that engagement. Visitors who spent more than 20 seconds at the kiosk and were old enough to provide a meaningful response were asked to rate the appeal of the exhibit using a 3-point scale (Yes, Somewhat, No) and to provide an explanation for their response. For those visitors who engaged the kiosk for 45 seconds or more, an interview protocol was used to probe their perceptions of the experience. The typical interview was completed in less than a minute. Unobtrusive observations were gathered on a total of 109 visitors of varying age and gender (Table 14). Ratings were gathered on a total of 66 visitors of varying age and gender. A total of 40 visitors of varying age and gender were interviewed (Table 17). The data were collected between December 23, 2006 and March 3, 2007.

The Hurricane Game/Flash Information display contains two interactive components. The first provides information pertaining to the distinctions among categories 1, 2, 3, 4 and 5 hurricanes; building options for hurricane mitigation; and neighborhood environmental factors affecting hurricane risk. The second component contains an animation showing step-by-step how a hurricane forms, a series of automated videos of hurricane destruction, tips on landscaping, and a segment on how different types of roofing materials weather a hurricane. This second component also contains a game entitled "Aim a Hurricane", which deals with meteorological elements involved with hurricane steerage. To engage the display screens, visitors move a cursor by means of a roller ball and click on the element of interest by means of a button. The display kiosk can comfortably accommodate one or two visitors at a time.

Summary of Results

Observations

Based on the unobtrusive observations, the duration off visitor engagement with the Hurricane Game/Flash Information kiosk tended to be relatively brief for visitors who were age 19 and under and age 40 or more. On the other hand, adults age 20 to 39 tended to stay with the display longer, typically 60 seconds or more (Figure 26). Visitor interactions with the kiosk displayed a similar pattern by age. Adults age 20 to 39 were more likely to fully engage the kiosk, as compared to those who were younger and older. Sizable percentages of those age 19 and under and age 40 or more limited their actions at the kiosk to merely staring at the initial screen of the display or playing with the panning key that moves an animated image up, down, left or right (Figure 27). Although the kiosk attracted a disproportionate number of young males, there were no clear gender differences in visitors' duration of engagement or in visitors' interactions.

Ratings

When presented with a three-point scale asking whether the exhibit appealed to them (yes, somewhat, no), the majority of the 66 visitors who were asked to rate the kiosk responded in the affirmative. However, there was a strong age-related pattern in the responses. Those age 19 and under were overwhelming affirmative in their response, and those age 20 to 39 were moderately affirmative. Visitors age 40 or more tended to be less so; particularly the 40 or more females, 55% of whom said they did not find the kiosk appealing (Figure 28). Visitors who did find the kiosk appealing offered a variety of explanations for their response. The most frequently occurring explanation concerned the usefulness of the information contained in the display. Also frequently mentioned were the graphics, the ability to select different options, and as one person put, the "way the roof blew off the house" (Table 15). Those who found the kiosk unappealing

generally complained about the difficulty in figuring out how to work it. This was especially true for females age 40 or more (Table 16).

Interviews

When interviewees were asked whether they found the interactive segments of the exhibit easy to use, a strong age pattern appeared in the responses. A clear majority of those age 19 and under and age 20 to 39 saw the exhibit as "very easy" to use; only a small percentage of those who were age 40 or more agreed with that response (Figure 29). When interviewees were asked whether the graphics and pictures were easy to understand, again a strong age pattern appeared in the responses. A clear majority of those age 19 and under and age 20 to 39 indicated that the graphics and pictures were "very easy" to understand. Interestingly, females age 40 or more responded similarly. However, males 40 or more gave the graphics and pictures fairly low marks for understandability (Figure 30). On the questions of whether they found the exhibit's information interesting, the interviewees gave widely varying responses. Half or more of the interviewees in all age by gender groupings except males age 20 to 39 identified the information as "mostly" interesting; half the 20 to 39 males characterized the information as "very" interesting (Figure 31). Somewhat similar results appear on the question of whether they found the exhibit's information useful. Half or more of the interviewees in all age by gender groupings except males age 40 or more identified the information as "mostly" useful; better than half the 40 or more males characterized the information as "very" useful (Figure 32).

Learning and Perceptions

The interviewees were asked, "Did you learn some useful things about how to protect your home from a hurricane?" The majority of interviewees indicated that they learned "a few useful things" from the kiosk. Only a small percentage in each age by gender grouping chose "lots of useful things" in answering the question. The most variable response came from females

age 20 to 39; they split their responses evenly across the three response options, "lots of useful things", "a few useful things", and "no, not much" (Figure 32). When asked if they saw anything related to hurricanes or hurricane preparation that they might want to learn more about on their own, the interviewees again gave variable responses. The most affirmative responses came from males 19 and under, and females 40 or more; 50% or more of these two groupings answered "yes". The most negative responses came from males 20 to 39 and males 40 or more; 50% or more of these respondents answered "no" (Figure 33). Those who responded affirmatively were then asked what they saw that they might want to learn more about. Typically, they focused on a particular piece of information such as roofing, landscaping or doors. Several, however, used this opportunity to declare that they had already made all the preparations they needed (Table 18). Interviewees were also asked if, based on what they saw in the display, they intend to reexamine their own home and surroundings in terms of reducing the risk from hurricanes. The responses were not very affirmative. Among those 19 and under and among females 20 to 39, the most frequently occurring response was "not sure". Among those 40 or more and among males 20 to 39, the most frequently occurring response was "no, not really" (Figure 35).

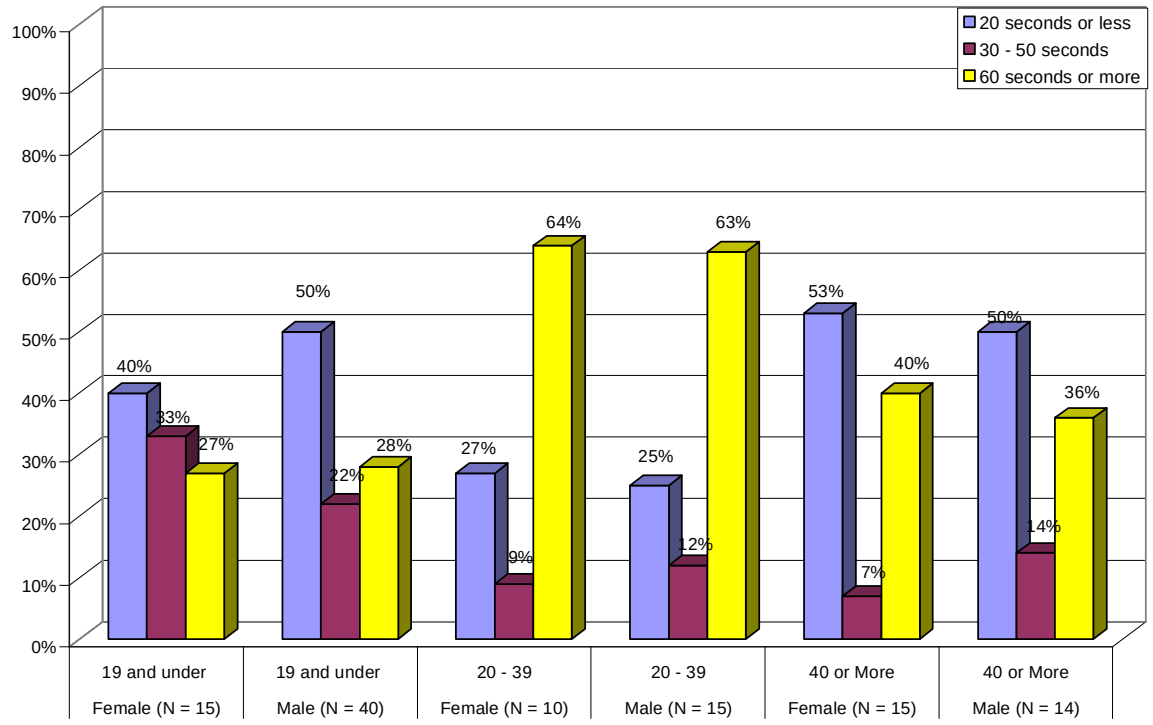
Hurricane Game/Flash Information Kiosk Table and Figures

Table 14

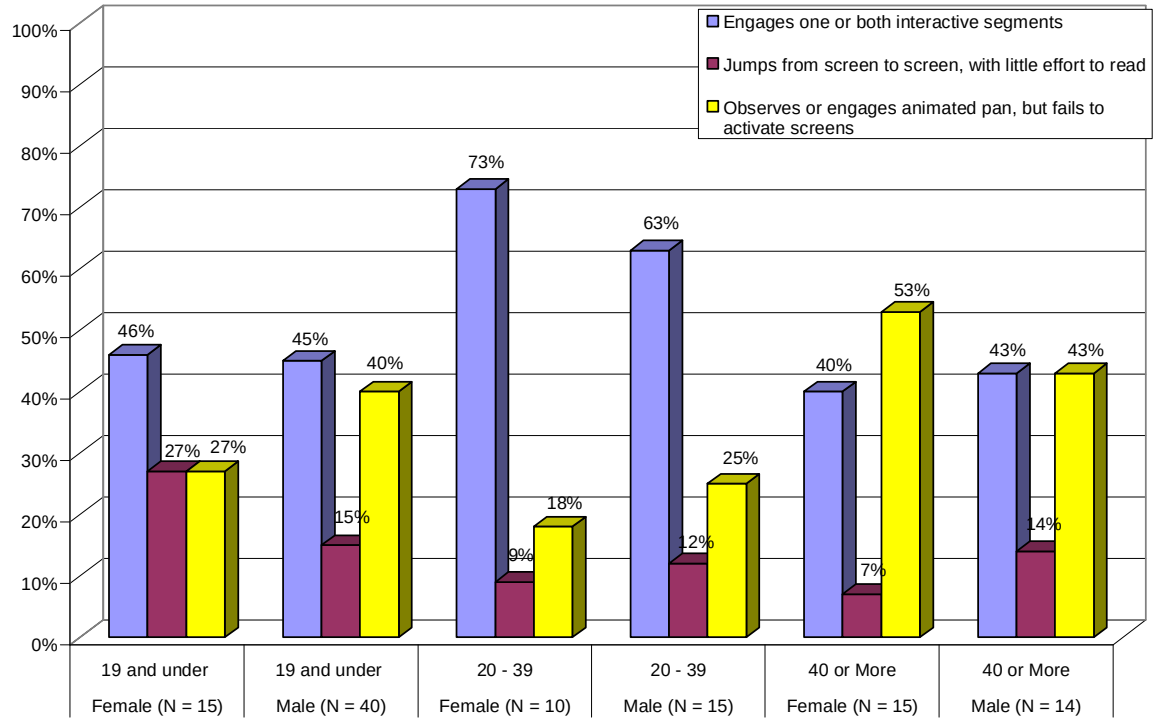
Number of Observations for Hurricane Game/Flash Information Kiosk, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	15	
	Male	40	
Subtotal		55	(50)
20 – 39			
	Female	10	
	Male	15	
Subtotal		25	(23)
40 or More			
	Female	15	
	Male	14	
Subtotal		29	(27)
Total		109	(100)

Hurricane Game/Flash Information Kiosk
Figure 26. Duration of Engagement by Gender and Approximate Age



Hurricane Game/Flash Information Kiosk
Figure 27. Vistor Action by Gender and Approximate Age



Hurricane Game/ Flash Information Kiosk
Figure 28. Did this exhibit appeal to you?
(by Gender and Approximate Age)

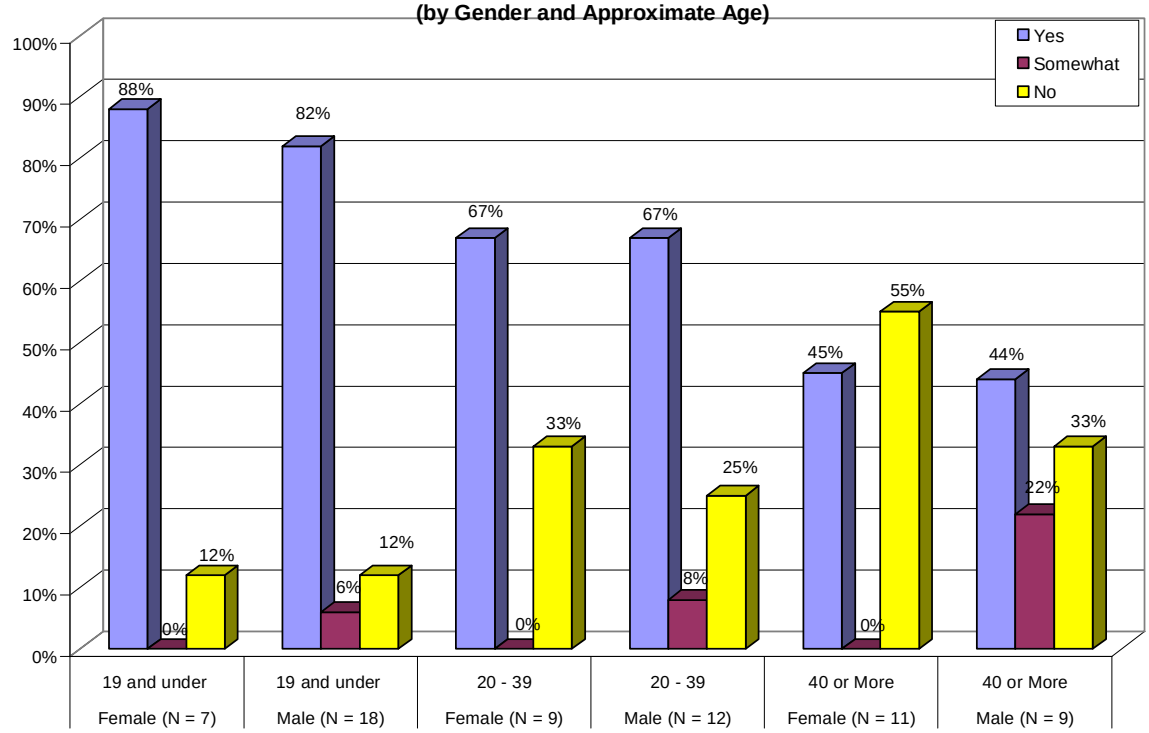


Table 15

If the Hurricane Game/Flash Information Kiosk Appealed to You, What was Most Appealing?

Age	Gender	
19 and Under		
	Female	• I like the wind blowing the trees • I liked seeing the roof come off • It teaches you about hurricanes • I liked the graphics and house information • Easy to use; also liked the graphics/pictures • Kind of cool, the way it shows a hurricane's effects
	Male	• I liked being able to change the settings; for example wind speed or type of house • I liked the graphics/the way the roof blew off the house • I liked the house construction information and the roller ball • I liked that it shows you what to put on your house to protect it • I liked the way you can change the wind speed • Fun to see how fast the wind could go • I like that it shows what happens to a house when a hurricane hits • I like how you can build your own house • Information was interesting • Liked the graphics • Liked it when the house started coming apart • Useful information • Liked the information about hurricanes, and being able to pan left and right
20 - 39		
	Female	• My son enjoyed watching the roof tiles blow off • I liked the kind of information it provides • I liked being able to test out the houses under different wind speeds
	Male	• Graphics were neat • Liked the kind of information it provided • I liked seeing the different options on home construction, which was better and so forth • Good information about landscaping • My job in the county relates to windstorm preparation, so this fits my interests • Lots of useful information
40 or More		
	Female	• Kind of cool with all of the options it gives • Information was very interesting • I liked the graphics, also ease of use • The graphics are nice
	Male	• Nice graphics • I liked the graphics • Good information • I liked the information being offered • It's something I need to know about

Table 16

If the Hurricane Game/Flash Information Kiosk Did Not Appeal to You, What was Not Appealing?

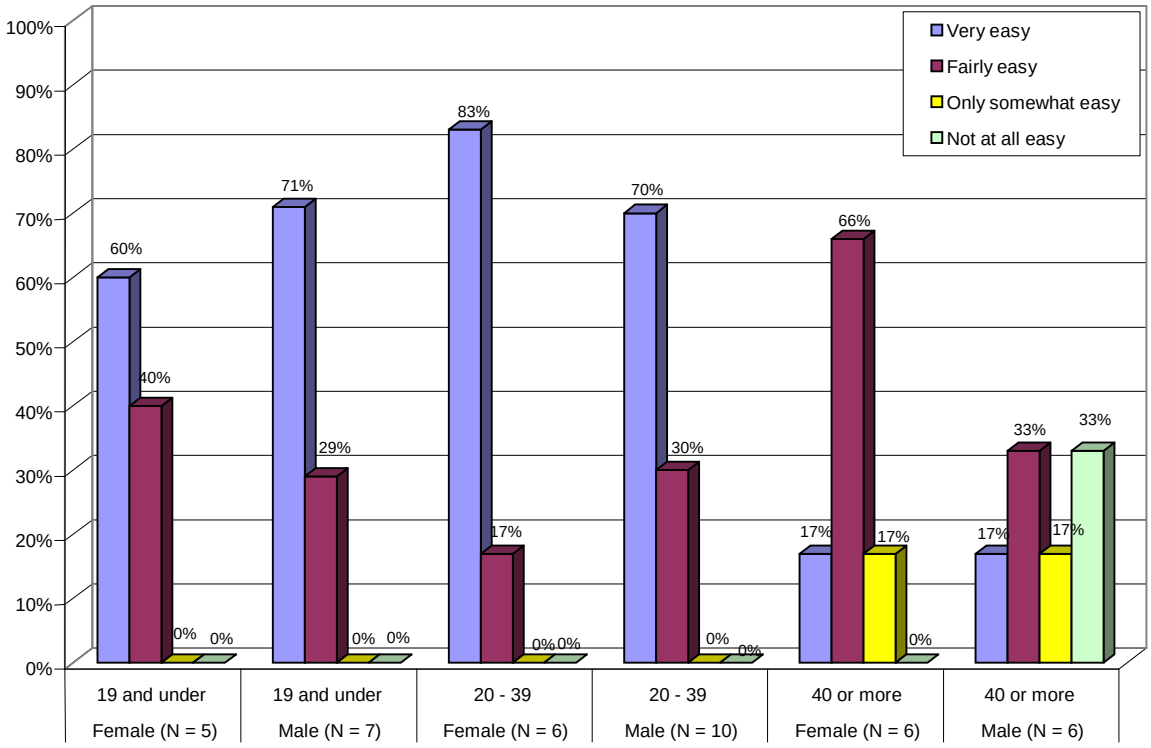
Age	Gender	
19 and Under		
	Female	• We couldn't figure out how to work it
	Male	• Too simple, not enough choices—maybe if more of the information was presented as a game
20 - 39		
	Female	• Didn't really understand it; there were no instructions • No matter what modifications were made to the house, the roof still came off • It's not hands-on enough; all you do is roll the ball around
	Male	• Couldn't figure it out; concept seems good but could use some instructions • No matter what modifications we made to the house, the roof still came off • I couldn't figure out how to play this game; need some instructions • Roller ball is awkward, and bending down is awkward
40 or More		
	Female	• Couldn't figure out how to work it • Don't know how to work this thing • Couldn't figure out how to work it • Game should give you a final screen to tell you if you selected the best options for safety • We couldn't figure out how to work it • I couldn't figure out how to get it to work
	Male	• Don't know how to work this thing • Game should give you a final screen to tell you if you selected the best options for safety • Didn't see the purpose of calling it a "game" • A better set of opening instructions would help—looks complicated

Table 17

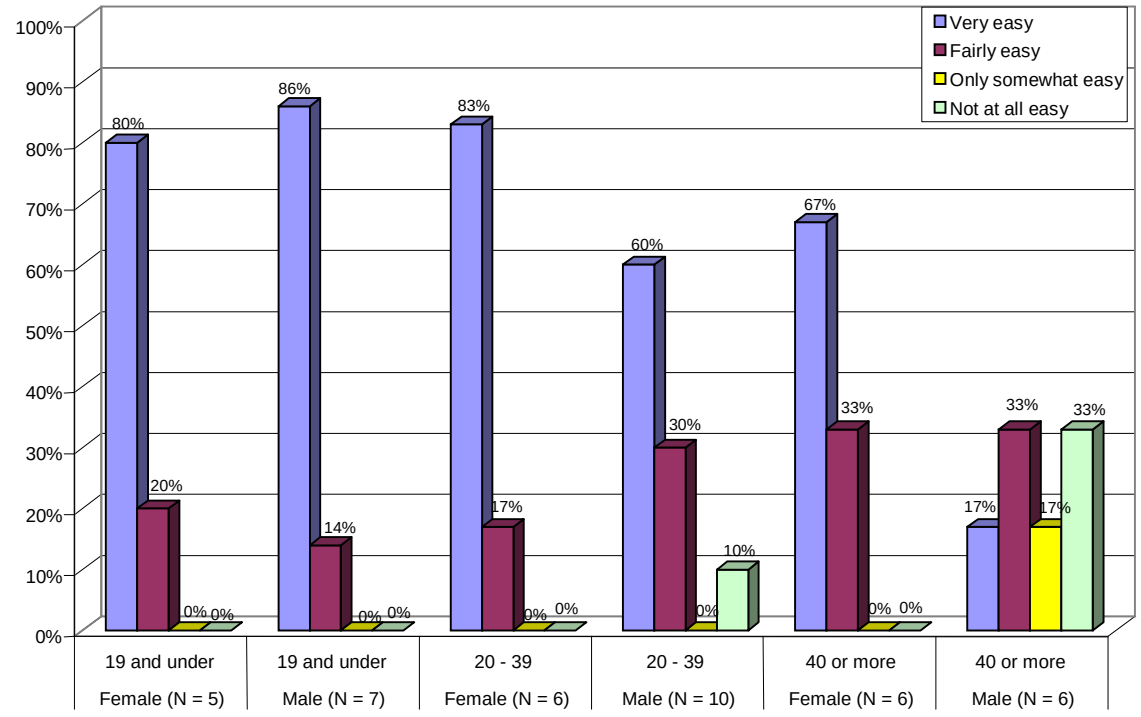
Visitor Reactions to Hurricane Game/Flash Information Kiosk, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	05	
	Male	07	
Subtotal		12	(30)
20 – 39			
	Female	06	
	Male	10	
Subtotal		16	(40)
40 or More			
	Female	06	
	Male	06	
Subtotal		12	(30)
Total		40	(100)

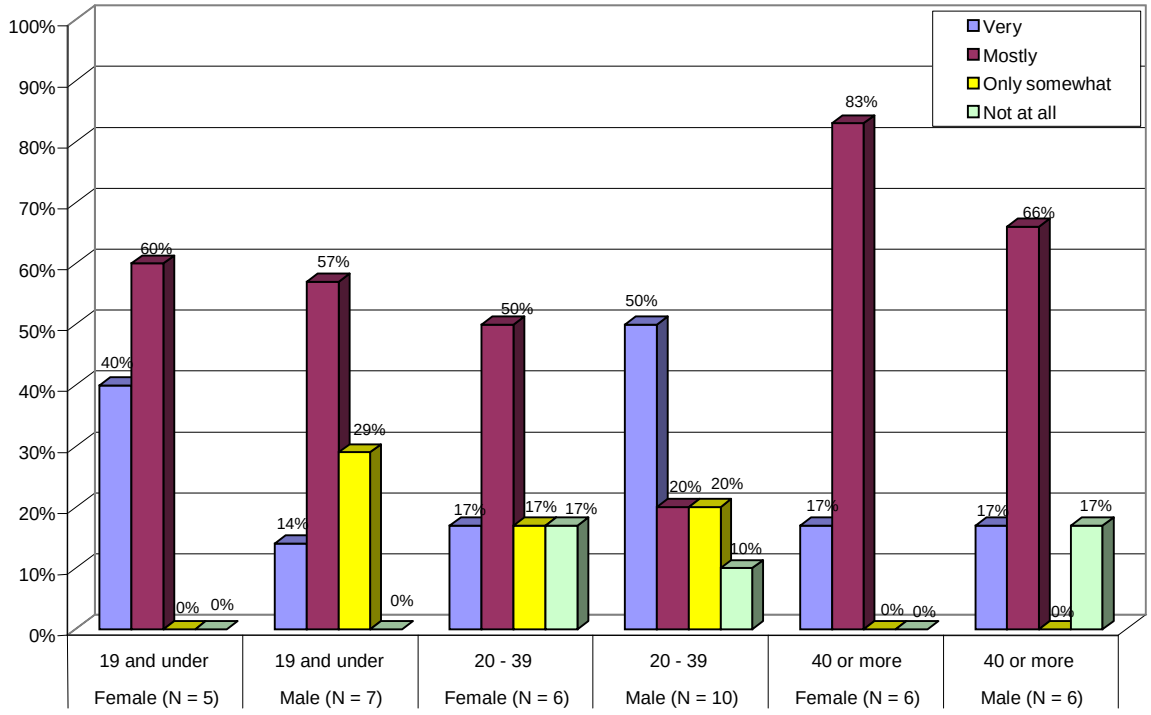
Hurricane Game/Flash Information Kiosk
Figure 29. Did you find the interactive segment(s) easy to use?



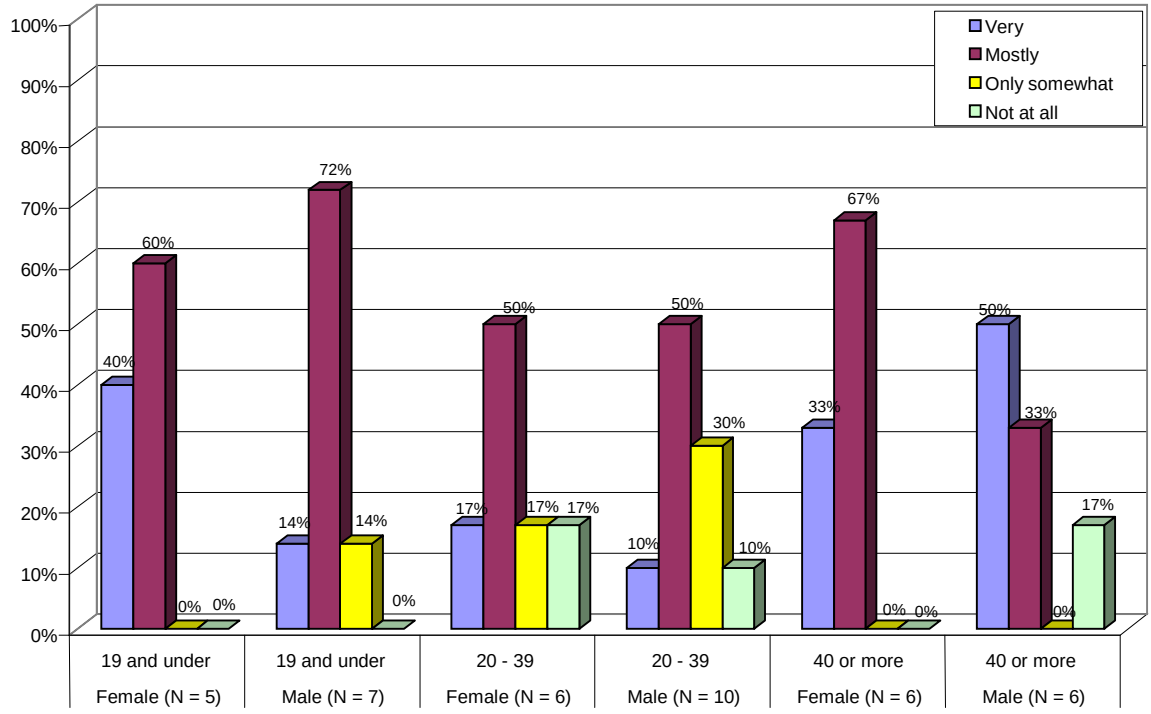
Hurricane Game/Flash Information Kiosk
Figure 30. Were the graphics and pictures easy to understand?



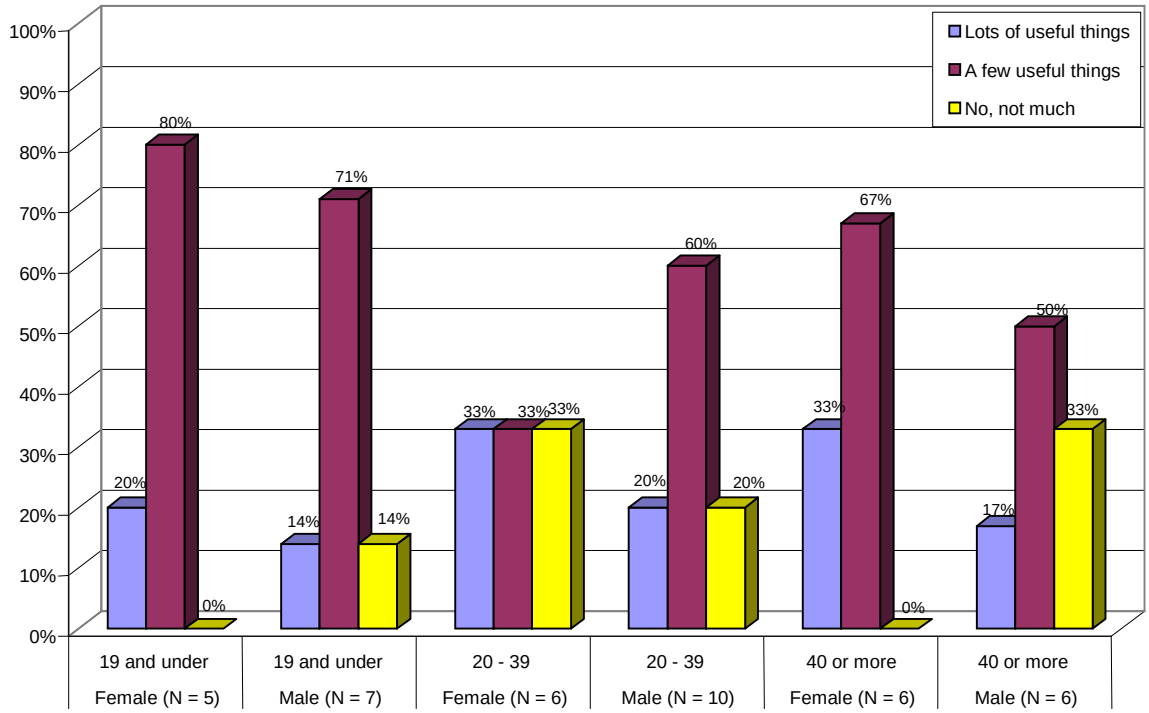
Hurricane Game/Flash Information Kiosk
Figure 31. Did you find the information interesting?



Hurricane Game/Flash Information Kiosk
Figure 32. Did you find the information useful?



Hurricane Game/Flash Information Kiosk
Figure 33. Did you learn some useful things about how to protect your home from a hurricane?



Hurricane Game/Flash Information Kiosk
Figure 34. Did you see anything related to hurricanes or hurricane preparation that you might want to learn more about on your own?

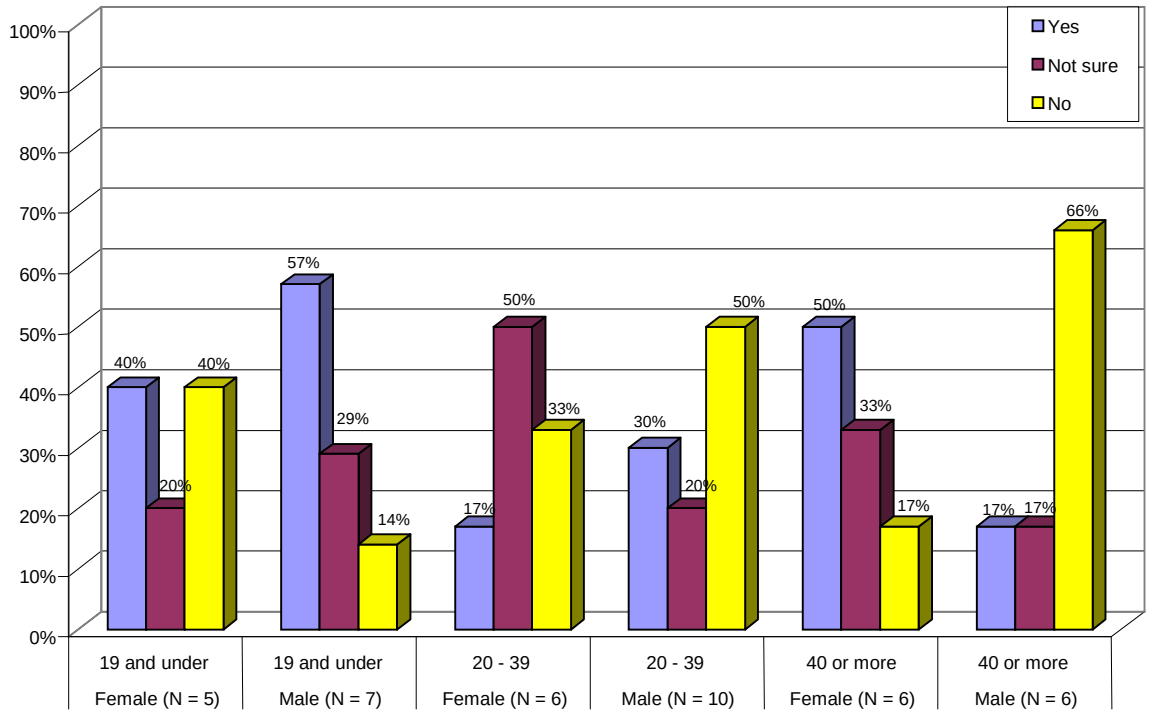


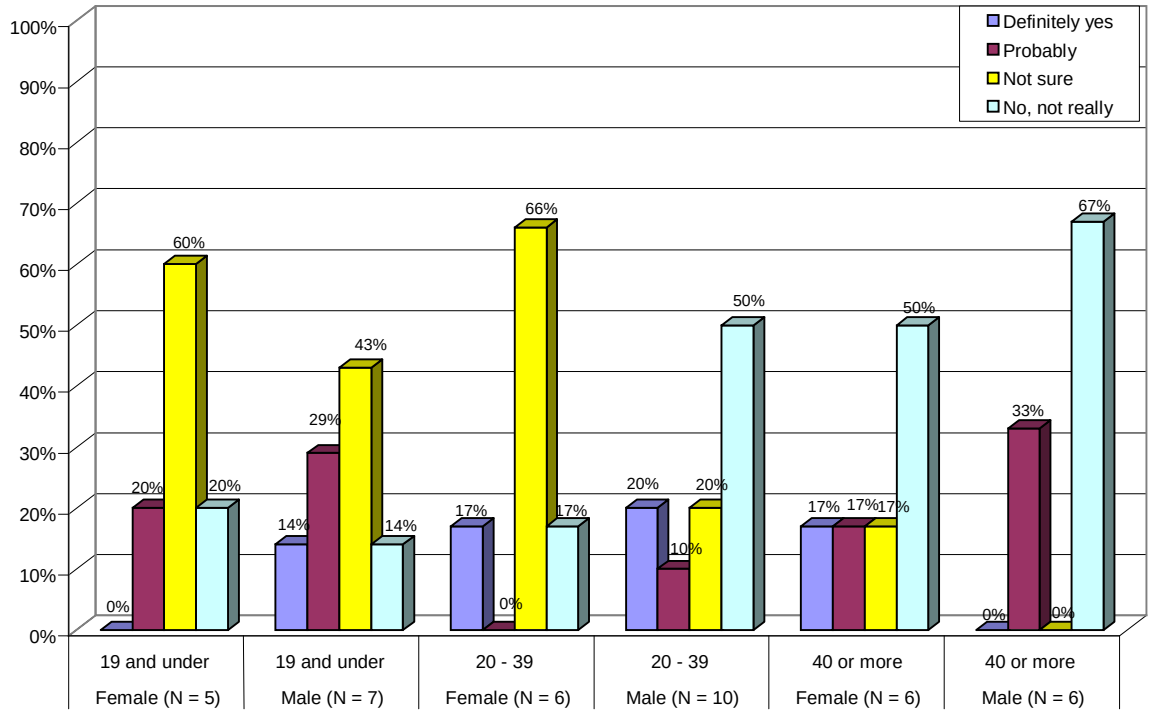
Table 18

Did you see anything related to hurricanes or hurricane preparation that you might want to learn about on your own? What might that be?

Age	Gender	
19 and Under		
	Female	• Nails are stronger than straps • How to build to protect from wind
	Male	• What types of buildings are best • Roofing • How they form • How to save the inside and outside of your house
20 – 39		
	Female	• Construction information
	Male	• Information on building types • Effect of wind on current conditions • Landscaping • I'm following the best practices already • I'm already aware
40 or More		
	Female	• The roofing • How hurricanes impact doors • Information about landscaping and types of buildings • We made all the preparations we need
	Male	• The roofing • We've made all the home preparations we need.

Hurricane Game and Flash Information Kiosk

Figure 35. Based on what you saw in the display, do you intend to reexamine your own home and surroundings in terms of reducing the risk from hurricanes?



Visitor Reactions to *Disasterville's* Earthquake Shake Table

Introduction

Visitors to the Earthquake Shake Table in *Disasterville* were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 91 visitors varying in age and gender were observed interacting with the exhibit, and a total of 52 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who properly activated the exhibit and/or observed its activation. The data were collected between November 20 and December 10, 2006.

The Earthquake Shake Table is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It provides visitors the opportunity to construct simple structures out of small blocks of varying shapes, and activate three levels of table vibration to observe the effects on the block constructions. The Earthquake Shake Table is about 40 inches square and raised about 36 inches off the museum floor. It can accommodate several visitors at a time.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of engagement with the Earthquake Shake Table ranged from 20 seconds or less to over two minutes. Time spent with the exhibit differed by visitors' gender and approximate age. Males 19 and under and both females and males 20 to 39 tended to spend more time with the exhibit than visitors in other age by gender

groupings (Figure 36). Almost all visitors to the exhibit engaged it fully, i.e., they assembled blocks, activated the table vibration, and observed the results (Figure 37).

Reactions

Not surprisingly, almost none of those interviewed about their reactions to the exhibit reported that they lived in an active earthquake zone (Figure 38). On the other hand virtually all of the interviewees indicated that they found the exhibit easy to understand and operate (Figure 39). As shown in Figure 40, those who spent the most time with the exhibit (males 19 and under, and females and males 20 to 39) also were the most likely to report that they found the exhibit "very" fun. Females 19 and under and older adults were somewhat less positive on the question; even so, 80% or more of these interviewees reported the exhibit to be "very" or "mostly" fun (Figure 40).

Learning and Perceptions

When asked what message they thought the exhibit is trying to get across, virtually all of the interviewees in each of the age by gender groupings stated that the message concerned the impact of earthquakes on buildings such as homes or other structures. Many saw the exhibit as a way of emphasizing the importance of building strong structures (Table 21). When asked, "Does this exhibit make you curious about how earthquakes affect buildings and other structures?" most of the interviewees in each age by gender grouping responded affirmatively" (Figure 41). When asked whether their experience with the exhibit made them want to learn more about earthquakes, again the majority in each age by gender grouping responded affirmatively. The most positive response came from males 19 and under (Figure 42). In response to the question, "What changes, if any, would make the exhibit more enjoyable or more informative?" the respondents offered a variety of ideas. Many suggested changing the blocks (more blocks, bigger blocks, interlocking blocks, greater variety of shapes). Many others proposed that the

blocks be replaced by lifelike miniature structures. Still others focused on the dial that activates the table vibration, suggesting that it have numbers corresponding to the Richter scale (Table 22).

Earthquake Shake Tables and Figures

Table 19

Number of Observations for Earthquake Shake Table, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	23	
	Male	34	
Subtotal		57	(62)
20 – 39			
	Female	09	
	Male	08	
Subtotal		17	(19)
40 or More			
	Female	07	
	Male	10	
Subtotal		17	(19)
Total		91	(100)

Earthquake Shake Table
Figure 36. Duration of Engagement by Gender and Approximate Age

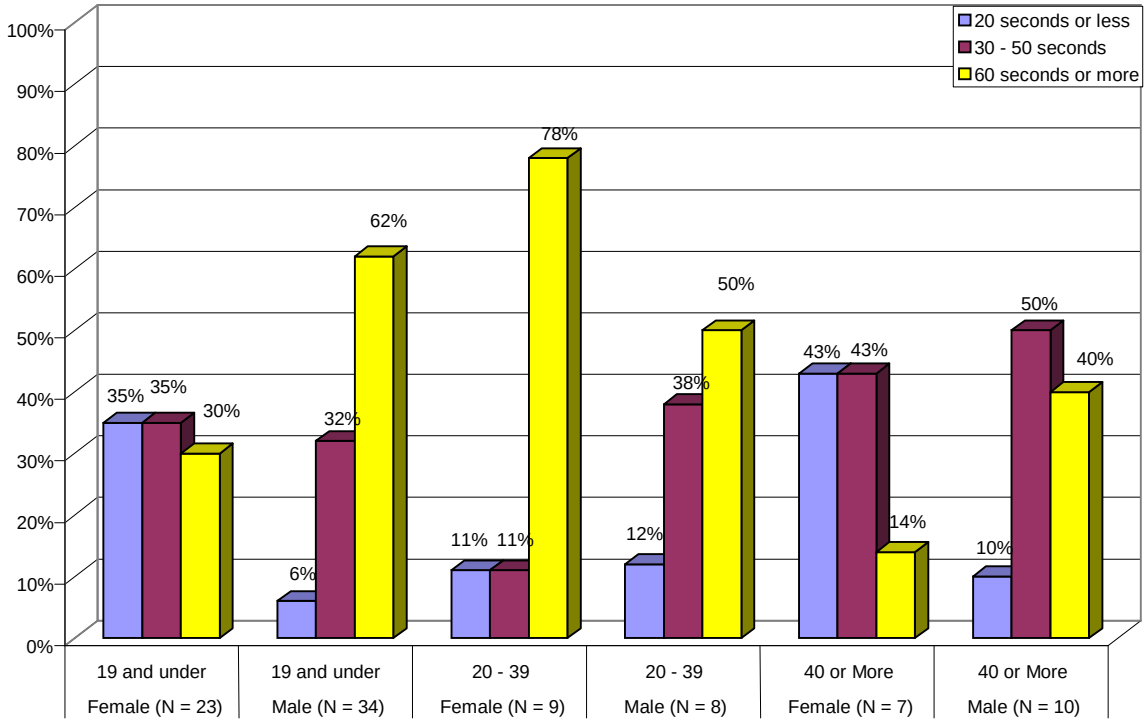


Figure 37. Earthquake Shake Table
Visitor Action by Gender and Approximate Age

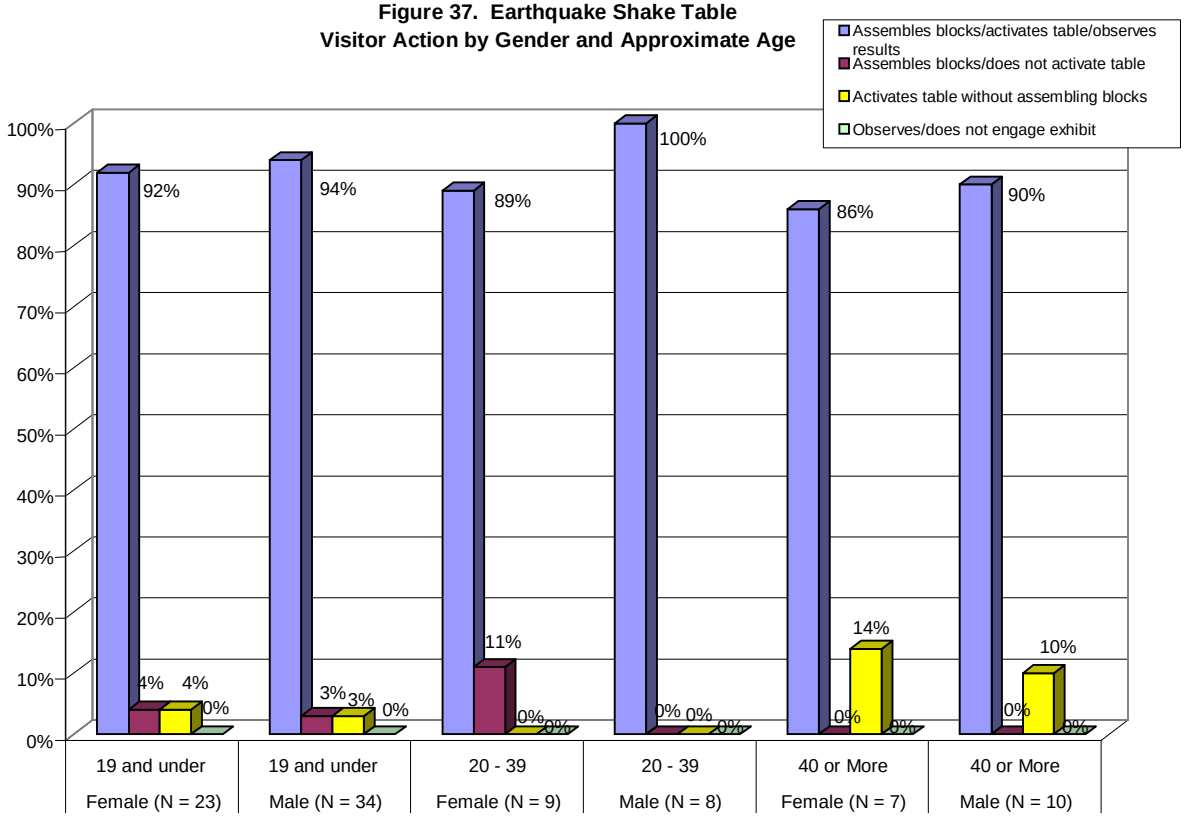
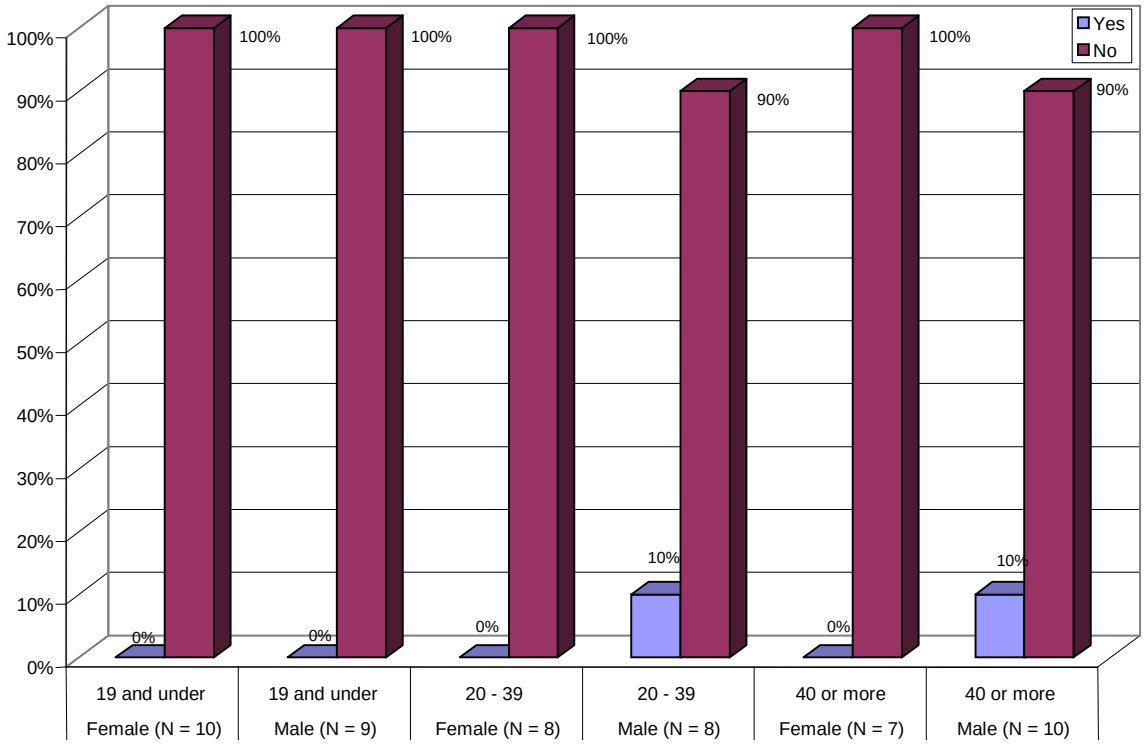


Table 20

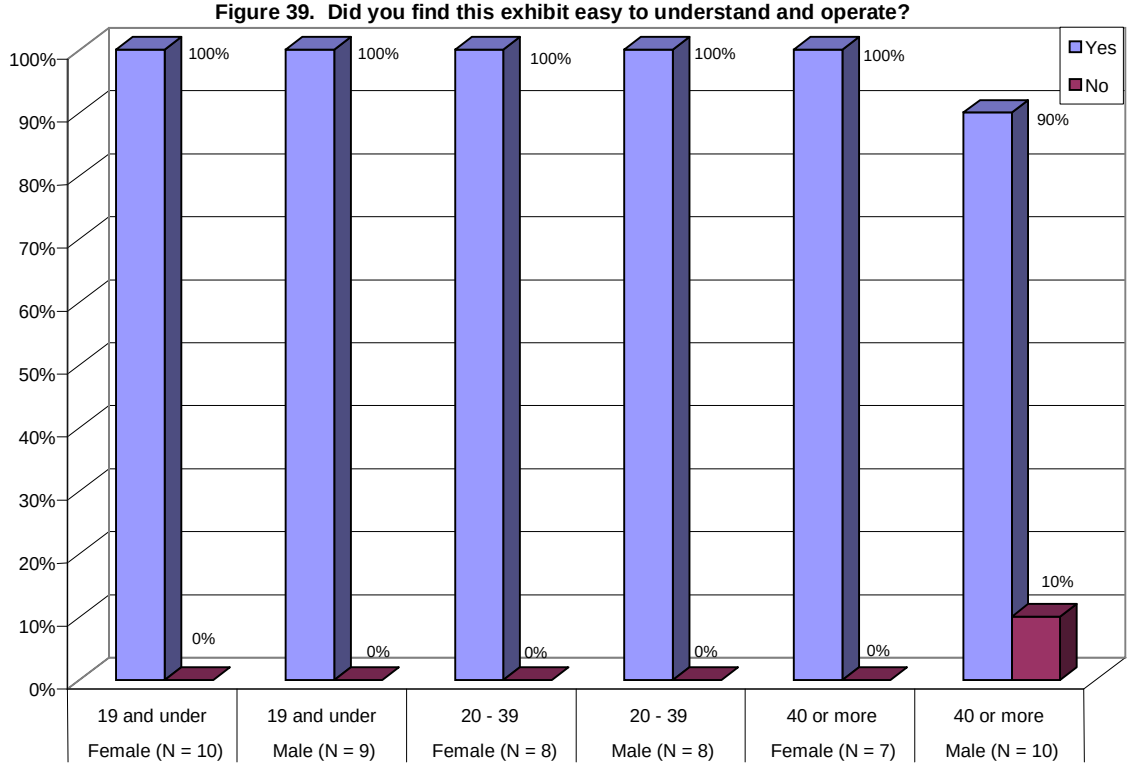
Visitor Reactions to Earthquake Shake Table, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	10	
	Male	09	
Subtotal		19	(37)
20 – 39			
	Female	08	
	Male	08	
Subtotal		16	(31)
40 or More			
	Female	07	
	Male	10	
Subtotal		17	(32)
Total		52	(100)

Earthquake Shake
Figure 38. Do you live in an active earthquake zone?



Earthquake Shake
Figure 39. Did you find this exhibit easy to understand and operate?



Earthquake Shake

Figure 40. Did you find this exhibit fun?

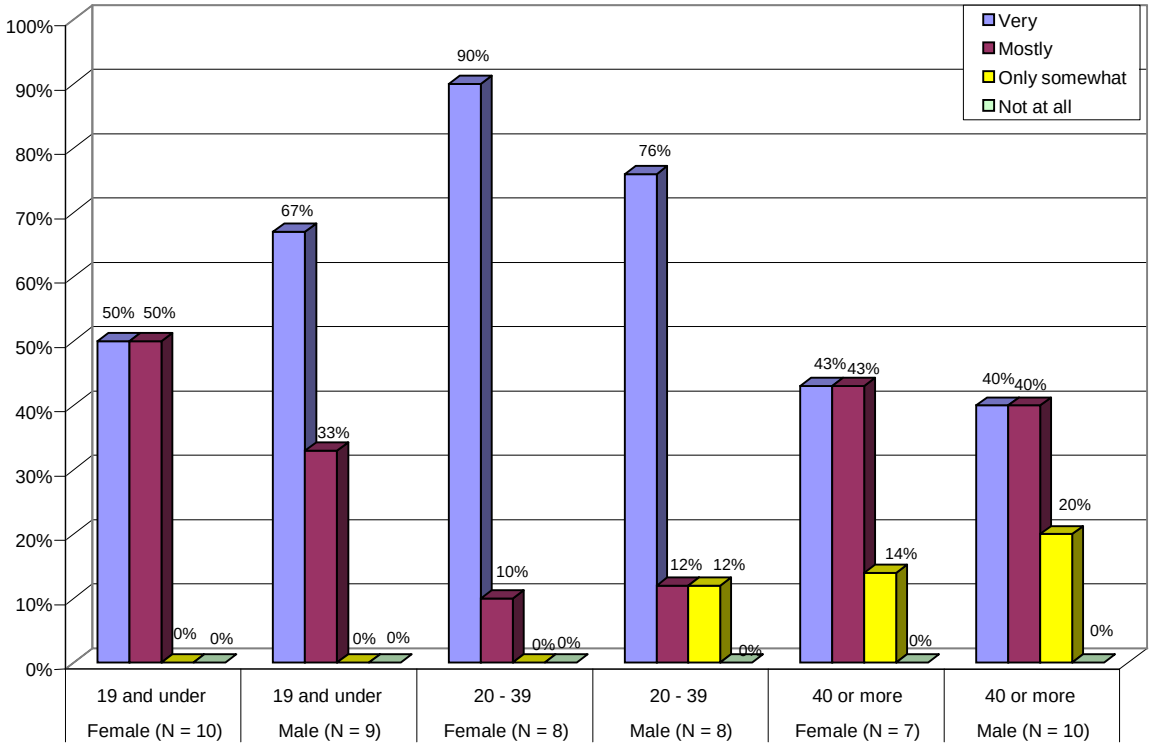
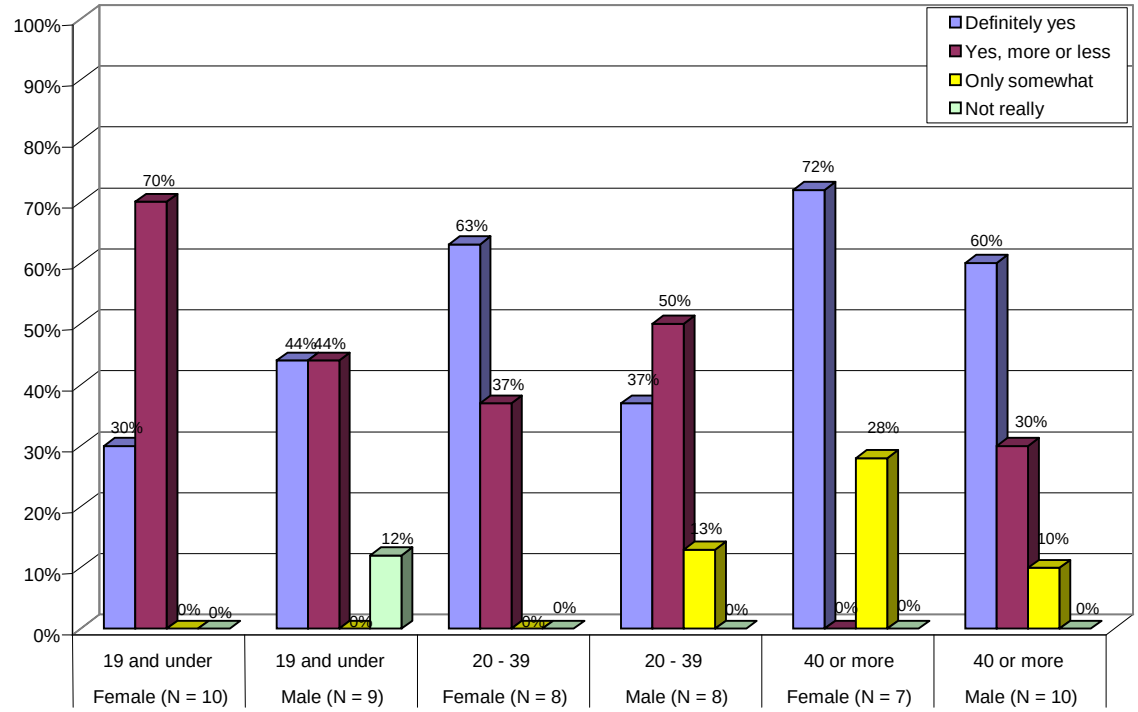


Table 21 ***Earthquake Table***

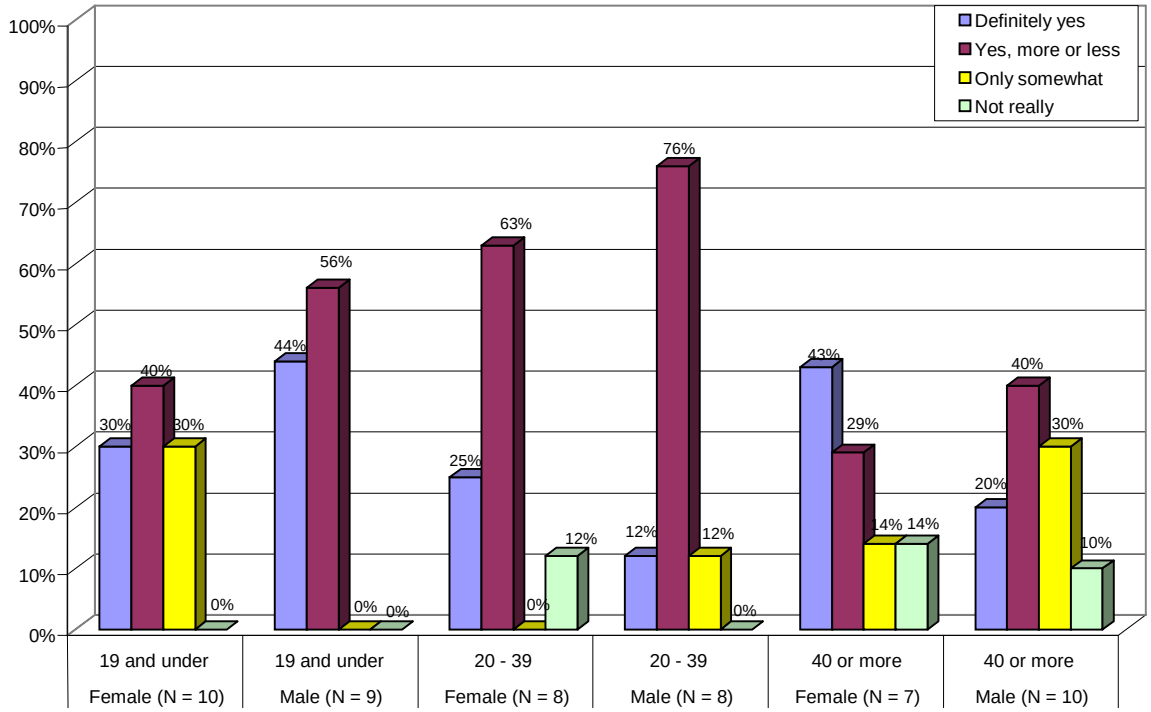
What message do you think this exhibit is trying to get across?

Age	Gender	
19 and Under		
	Female	• What an earthquake can do to your house • Earthquakes can be very dangerous to buildings • Earthquakes are strong • Build strong buildings • Dangers of earthquakes • Intensity of earthquakes • How strong an earthquake can be • Buildings may not be sturdy enough in an earthquakes
	Male	• How fast an earthquake can hit • Earthquakes are very powerful • How earthquakes knock down buildings • How earthquakes affect buildings • How easy your house can fall apart • Earthquakes are dangerous • Dangers of earthquakes
20 - 39		
	Female	• What happens to buildings in an earthquake • Difficult to build an earthquake proof building • Earthquake will cause things to fall • Damage an earthquake can do • Blocks further from the center of the quake don't fall as easily • To build the most stable structure to withstand earthquakes • What happens to houses in an earthquake
	Male	• Idea of what vibrations do to buildings • Earthquakes can damage most anything • Affect of level of earthquakes on different structures • Different impact of earthquakes on structures • Build your houses solid if you live in an earthquake zone • How you build a structure affects how well it stands • How different shapes hold up in an earthquake
40 or More		
	Female	• Strength of seismic activity • Take precautions about earthquakes • To show that some pieces fall more quickly according to shape • Shows the power of an earthquake • Earthquakes can destroy things • Build strong structures
	Male	• How vibration can affect structures • How earthquakes knock down buildings • Build our houses better • See how hard it is to build an earthquake proof building • Teach how different forces in nature works • Impact of earthquake on structure • To show varying intensity of earthquake • How structures fall in an earthquake • Give ideas for building to handle earthquake

Earthquake Shake
Figure 41. Does this exhibit make you curious about how earthquakes affect buildings and other structures?



Earthquake Shake
Figure 42. Does this experience make you want to learn more about earthquakes?



Earthquake Table

Table 22

What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• More blocks, explanatory text • Have an indicator for how strong the tremor is • Add a gauge that tells you the strength of the earthquake • Better blocks, like a house • Pictures of other people building blocks to give them ideas • Add bigger blocks
	Male	• Different blocks/more; larger, interlocking • Needs signs, more blocks/interlocking • Make it stronger and weaker • Give instructions • Have actual miniature buildings.
20 – 39		
	Female	• Make the blocks so you can build a house • Add narrative that explains the exhibit • If structures looked like buildings, more authentic • Greater variety of blocks • Identify dial settings so that visitor can determine strength of the shaking • Have blocks that look more like buildings • Add narrative to tell us what do to with this exhibit • More background and lifelike building
	Male	• Make it bigger so people could stand on it • Lower it for little kids • Sound effects, more blocks/different sizes and shapes • Add instructions • Identify dial settings • Add more blocks that interlock • It should suggest different strategies for building
40 or More		
	Female	• Have an assembled building and watch it fall. Put seismic readings on the dial • More than just blocks, use miniature buildings • Have pieces look more like real structures (furniture, etc.) • A video showing how earthquakes affect structures • Add numbers to dial to indicate force of quake • Make it a little lower for the very young children
	Male	• Have building already made so you can push button and see it come down, then have it reassemble automatically • Buildings that are preassembled that allow you to observe affects of tremor • Have the dial such that if you could tell what the Richter scale is • It looks fragile • Put numbers on dial corresponding to Richter scale • Put Richter number on knob. Have buildings of different sizes and shapes to show how some fall over more easily than others

Earthquake Jump Exhibit

Introduction

Visitors to the Earthquake Jump Exhibit in Disasterville were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 127 visitors varying in age and gender were observed interacting with the exhibit, and a total of 62 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who properly activated the exhibit and/or observed its activation. The data were collected between December 2 and December 22, 2006.

The Earthquake Jump Exhibit is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It provides visitors the opportunity to create a "seismic wave" on a computer screen and a numerical reading on a vertical scale by jumping on a slightly raised circle within the exhibit. The Earthquake Jump Exhibit can accommodate several visitors jumping simultaneously, although it works best with one person at a time. The outer sides of the three panels that support the exhibit contain information about earthquakes. However, the focus of the evaluation was on the jumping activity going on within the three panels.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of visitor engagement with the Earthquake Jump exhibit was relatively brief, seldom lasting more than thirty seconds. Females

in the 19 and under age category appeared to spend the least amount of time with the exhibit (Figure 43). The majority of visitors in the 19 and under and 20 to 39 age categories attempted to activate the exhibit, but many were unable to activate it fully (lock their "seismic wave" on the display screen and activate a numerical reading on the vertical scale). But the attempts, whether fully successful or not, were made with considerable enthusiasm. Many of the older visitors (40 or more) were content to simply observe without engaging the exhibit (Figure 44). The evaluators observed that a number of visitors who approached the exhibit appeared puzzled by the exhibit and simply stood and stared at it. This behavior was most likely to occur if visitor traffic on the museum floor was light and the exhibit was not being engaged as the visitor approached.

Interviews

The great majority of visitors who were interviewed reported that they did not live in an active earthquake zone (Figure 45). In fact, only four of the 62 interviewees so indicated. A number of the interviewees expressed difficulty in figuring out how to engage the exhibit. This appeared to be less of a problem for those 19 and under than for some of the adults (Figure 46; Table 25). Most of the interviewees reported finding the exhibit both "fun" and "informative", but there were marked differences in these perceptions depending upon age. Those 19 and under were far more likely to report that the exhibit was "fun", as compared to those 40 or more. On the other hand, the older interviewees, along with young male interviewees, were the most likely to characterize the exhibit as "informative" (Figures 47 and 48).

Learning and Perceptions

When asked, "Does this exhibit make you curious about how earthquakes are measured?" the majority of interviewees in all categories except males 20 to 39 responded "Definitely yes"

or "Yes, more or less". Those interviewees 19 and under were the most affirmative on this question (Figure 49). When asked, "Does this experience make you want to learn more about earthquakes?" again differences appeared by age. Interviewees 19 and under were noticeably more affirmative as compared to interviewees in the other two age categories. An interesting dichotomy appeared in the responses of the females age 40 or more; almost all responded either very positively or very negatively to the question (Figure 50). When asked, "What changes, if any, would make the exhibit more enjoyable or more informative?" interviewees offered a range of suggestions. By far the most numerous were suggestions about the need to add instructions to clarify the purpose of the exhibit and how it operates (Table 26).

Judging by the number of visitors who stopped to engage or examine the Earthquake Jump, this exhibit appeared to be among the most popular on the floor.

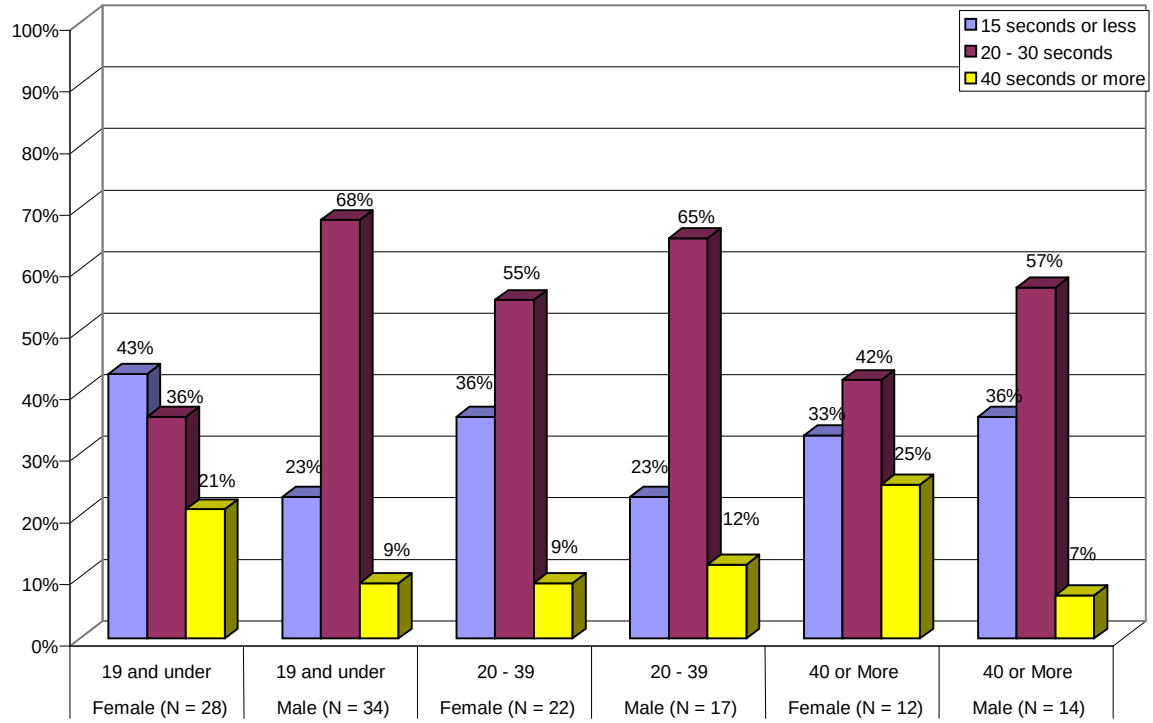
Earthquake Jump Tables and Figures

Table 23

Number of Observations for Earthquake Jump Exhibit, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	28	
	Male	34	
Subtotal		62	(49)
20 – 39			
	Female	22	
	Male	17	
Subtotal		39	(31)
40 or More			
	Female	12	
	Male	14	
Subtotal		26	(20)
Total		127	(100)

Earthquake Jump Exhibit
Figure 43. Duration of Engagement by Gender and Approximate Age



Earthquake Jump Exhibit
Figure 44. Visitor Action by Gender and Approximate Age

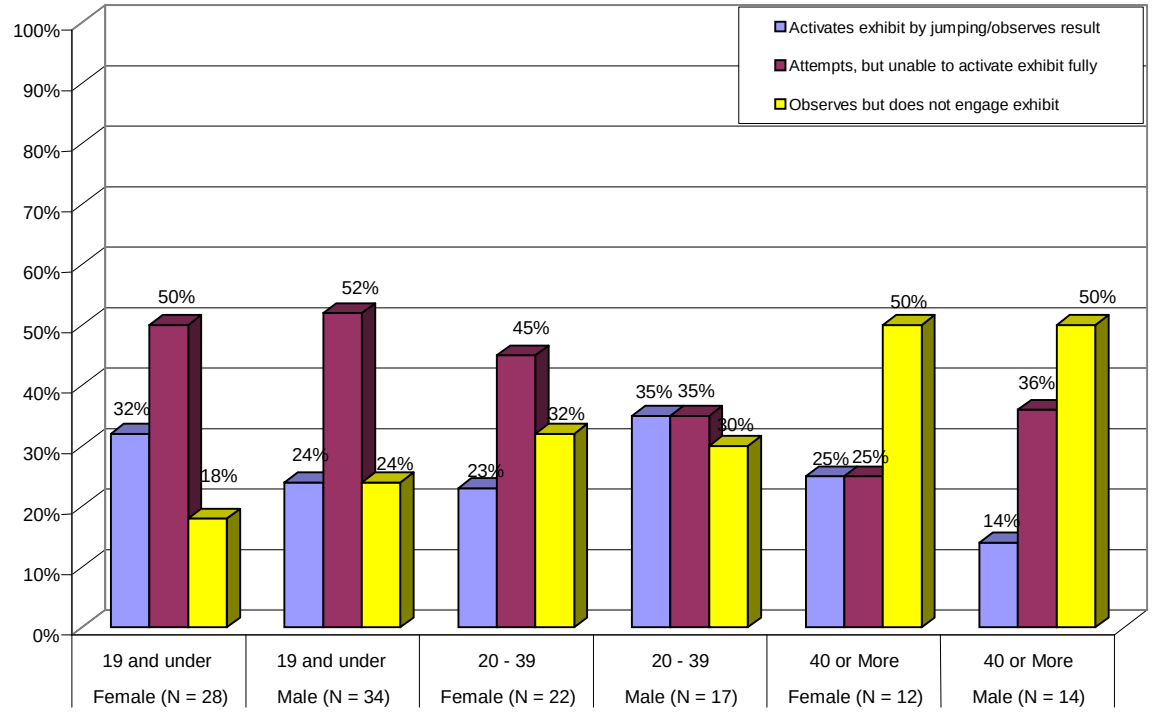


Table 24

Visitor Reactions to Earthquake Jump, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	07	
	Male	12	
Subtotal		19	(31)
20 – 39			
	Female	13	
	Male	13	
Subtotal		26	(42)
40 or More			
	Female	08	
	Male	09	
Subtotal		17	(27)
Total		62	(100)

Figure 45. Do you live in an active earthquake zone?

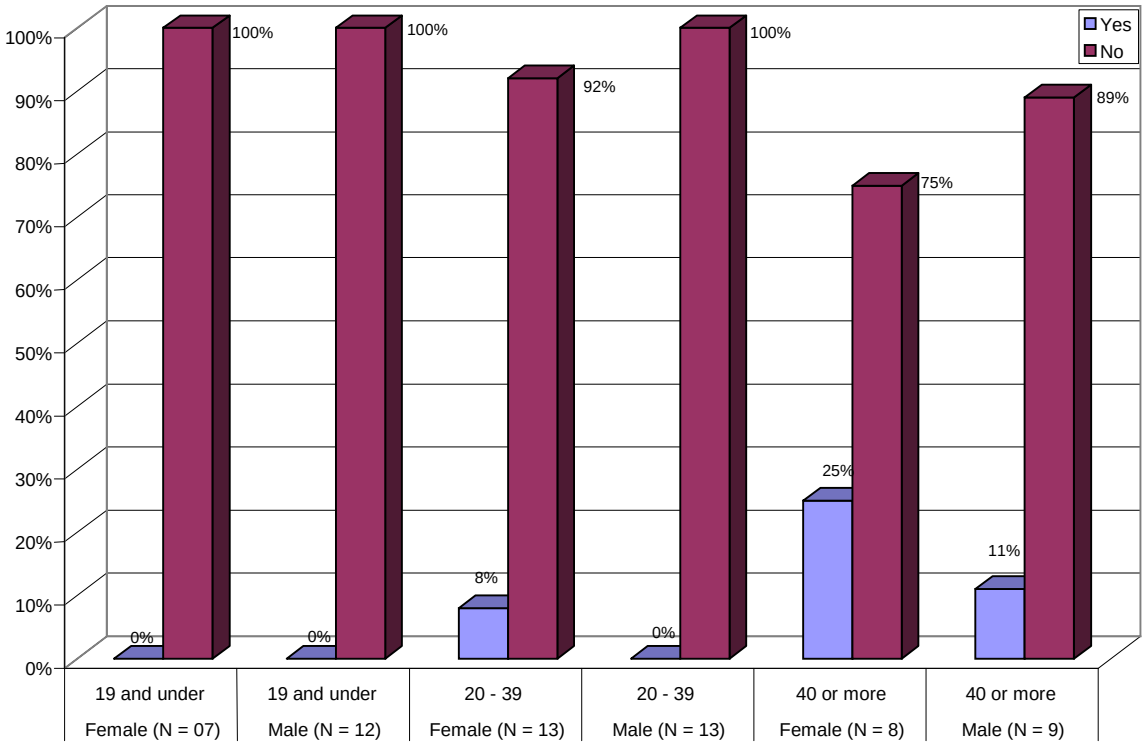


Figure 46. Did you find this exhibit easy to understand and operate?

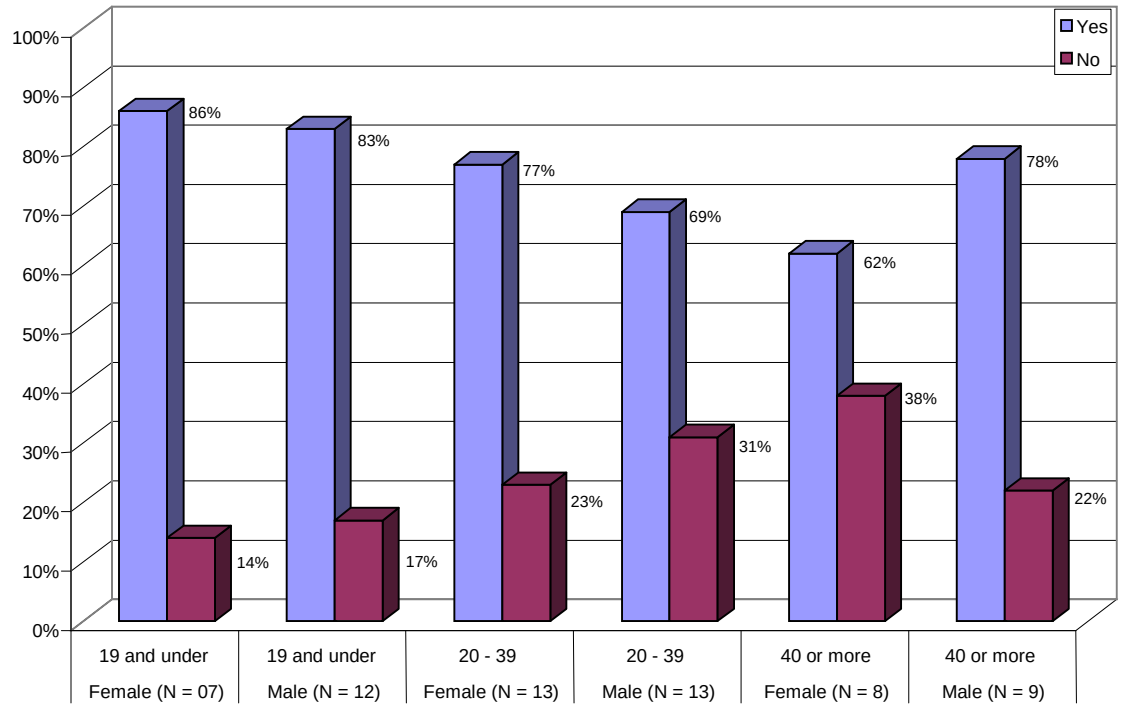


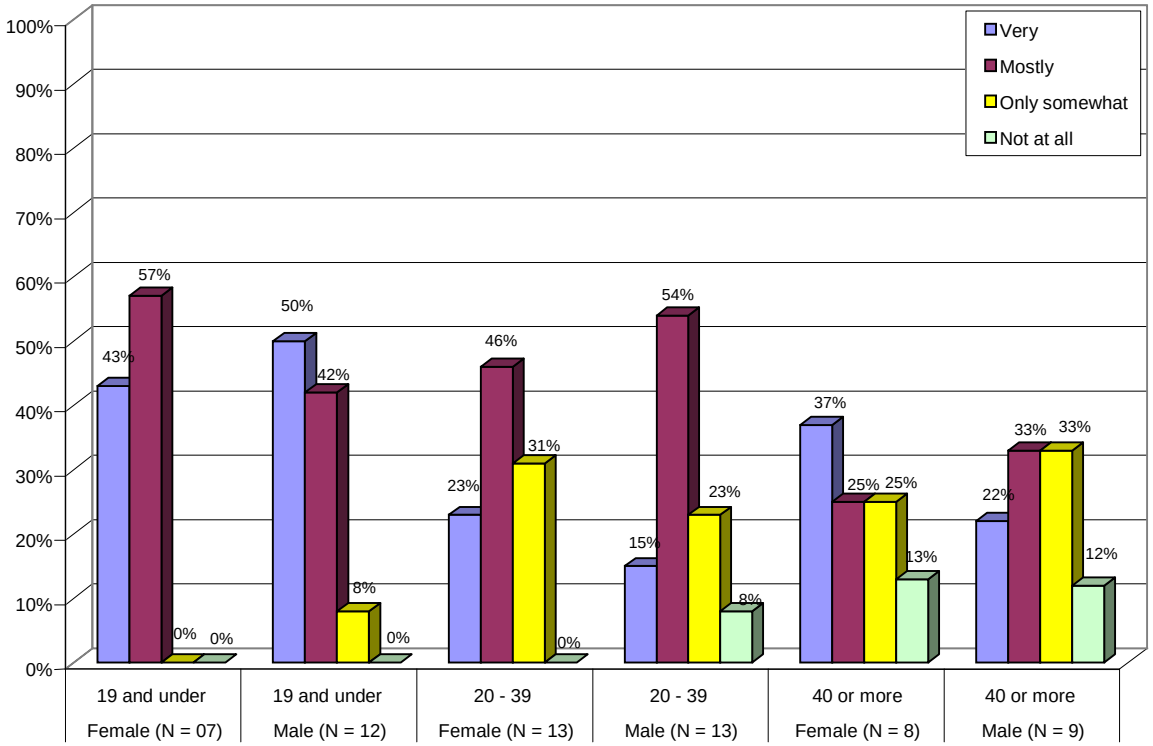
Table 25

If not easy to understand and operate, what was the problem?

Age	Gender	
19 and Under		
	Female	• Didn't react easily to my jumps.
	Male	• Had to be explained • Not sure what to do
20 – 39		
	Female	• It needs instructions as to what to do • More explanation needed
	Male	• There are no instructions • Needs instructions
40 or More		
	Female	• Wasn't clear to me what it was about at first • No directions – I don't understand the purpose • Had to be explained
	Male	• No directions are given

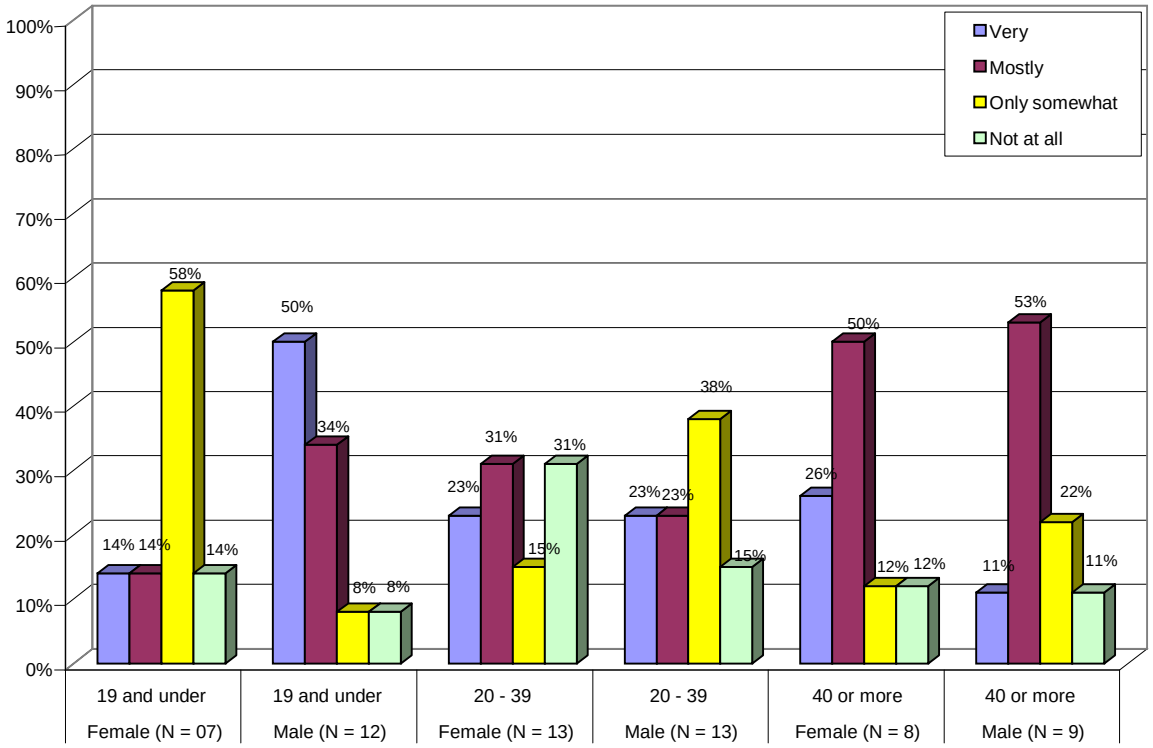
Earthquake Jump

Figure 47. Did you find this exhibit fun?



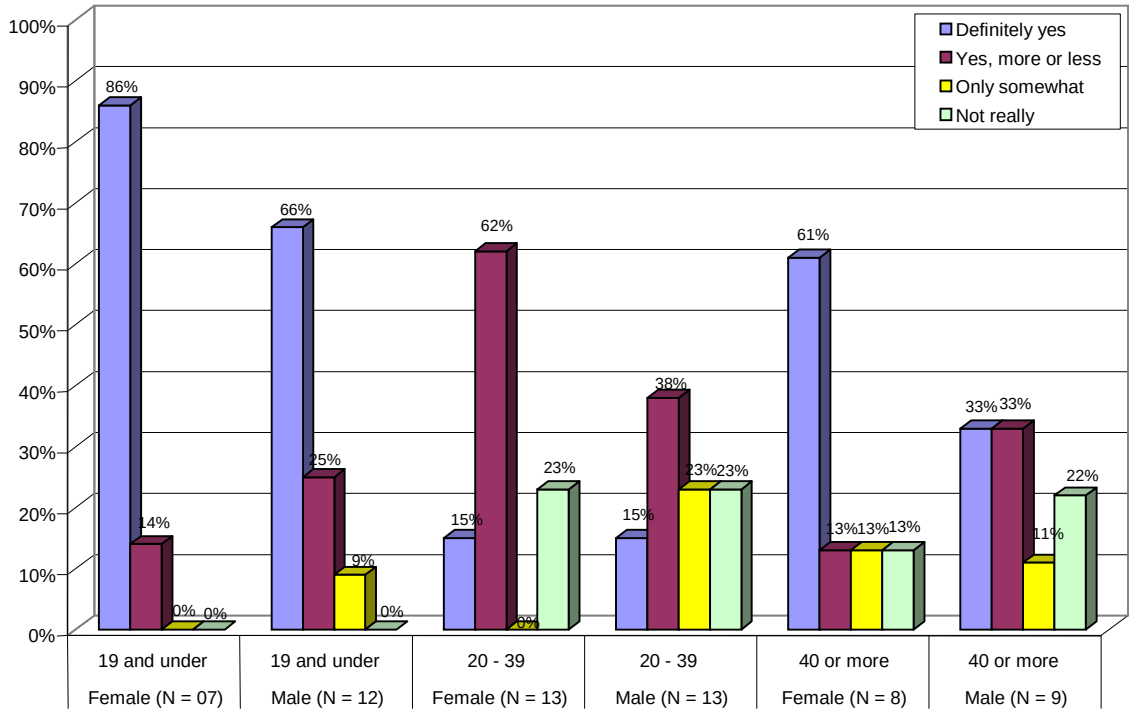
Earthquake Jump

Figure 48. Did you find this exhibit informative?



Earthquake Jump

Figure 49. Does this exhibit make you curious about how earthquakes are measured?



Earthquake Jump

Figure 50. Does this experience make you want to learn more about earthquakes?

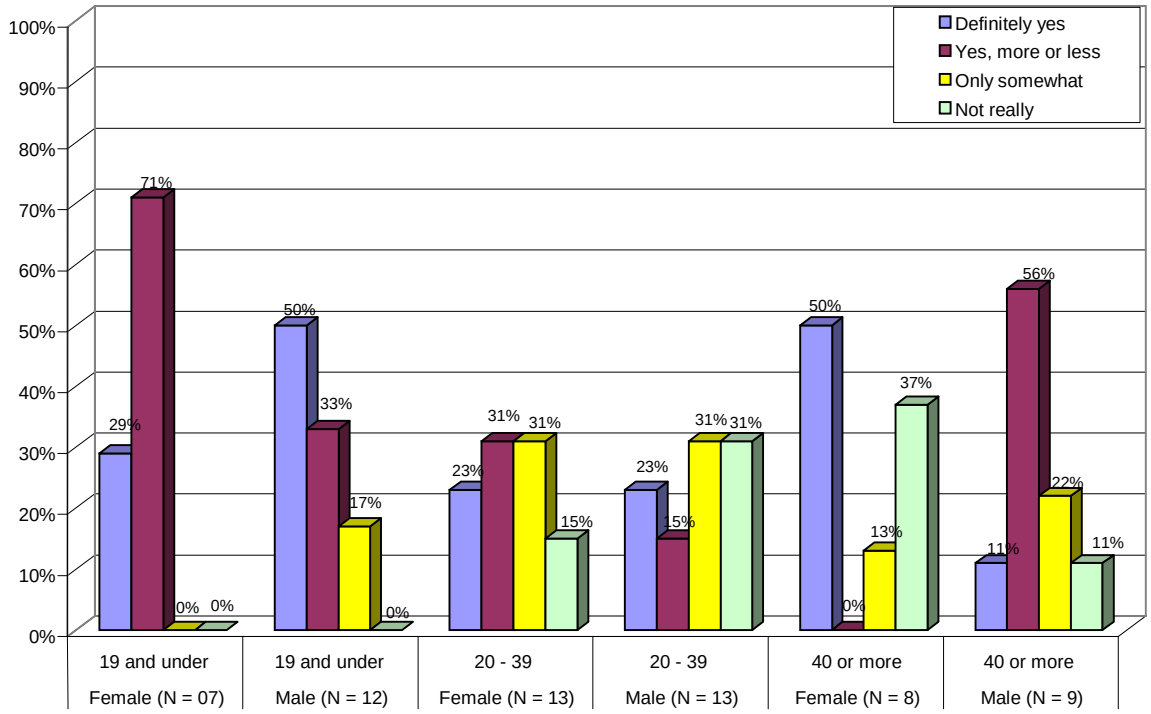


Table 26

What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• Perfect – cool • Make the floor move like in an earthquake • Make the scale light up above 10; it only lights up to 10, no higher
	Male	• Add indicator that tells you what level quake you are creating. • Make the vertical scale light up to 15 • Need a sign giving instructions
20 – 39		
	Female	• Add instructions as to what td do • Make it give you a print out so you can take your results home with you • Add instructions • Clarify what the numbers on the vertical scale mean • Add an explanation as to what it's for • Have something that explains that it deals with earthquakes • Add narrative so kids know what it is. Show earthquake zones on panels • Provide explanations of what the computer screen shows, maybe a label to tell people it's a seismic reader • Add information to help kids understand what the numbers mean • Have something that makes you feel an earthquake • Some more hands on stuff for the kids • Add numbers to the graph
	Male	• Add instructions to the panel so people know what to do • Add instructions as to how it works • Add information on panels • Add directions as to what you are looking at • Lower screen so kids could relate to it • More instructions • Make the vertical scale more obvious • Show a comparison between the tremor I created and an actual tremor • Make it more sensitive to the jump - hard to get it to register. • Add instructions so we know to jump in the red target
40 or More		
	Female	• It should be clear as to its purpose • Have the ground move under you according to the size of the quake • Need something to catch our attention • Need a sign that gives instructions as to what to do
	Male	• Have the floor move under you according to the size of the quake • Have it so it shakes like an earthquake • Have the floor move to simulate an earthquake • Add instructions – explanation of what you are seeing on screen and what the vertical scale means. • More information on the graphs. More narrative on what 'it' is. • Have it so you walk on, push a button and feel like you're in an earthquake.

Visitor Reactions to Disasterville's Dare to Enter the Forest Game Kiosk

Introduction

Visitors to the Dare to Enter the Forest game kiosk in Disasterville were observed and interviewed by the evaluators regarding their experience with the game. An observation protocol was used to unobtrusively observe visitor interactions with the game and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 75 visitors varying in age and gender were observed playing the game, and a total of 52 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who completed all or most of game. The data were collected between December 23, 2006 and January 13, 2007.

Using touch screen technology, the Dare to Enter the Forest game presents a total of 10 T/F questions to the player, with each question followed by a message as to whether the player's response was correct or incorrect, and an explanation. Each question concerns some aspect of wildfire, its causes, effects or mitigation. Both the questions and the answers are presented against a backdrop of wildfire images. A total score is provided at the end of the game, along with an interpretive comment on the quality of the player's performance. The game kiosk can comfortably accommodate one or two visitors at a time.

Summary of Results

Observations

Based on unobtrusive observations, the duration of visitor engagement with the Dare to Enter the Forest wildfire game was typically 60 seconds or longer. In comparison to others female 19 and under tended to spend less time with the game, often only 20 seconds or less (Figure 51). In terms of visitor action, a distinct majority of respondents in all age by gender

groupings completed the entire game, typically taking the time to read the results of their responses. However, a significant minority of females in the 19 and under and 20 to 39 age groupings left the game unfinished. Most of the incompleters in the female 20 to 39 grouping took the time to read the answers to the questions they worked on; some of the incompleters in the female 19 and under grouping simply jumped through the questions with little effort to read (Figure 52).

Interviews

The majority of the interviewees in all age by gender groupings except male 19 and under reported that they did not live in or near a heavily wooded area (Figure 53). Asked whether the wildfire game was fun, the most typical response from the interviewees in each age by gender grouping was that it was "mostly" fun. Relatively few characterized it as "very" fun (Figure 54). Asked about the relative difficulty of the game, a majority in each age by gender grouping reported that it was neither too easy nor too hard but "about right". All of the respondents in the female 40 or more grouping reported it to be about right. Some of the young adults found it to be too easy (Figure 55).

Learning and Perceptions

For the most part, female interviewees 19 and under and 40 or more indicated that they learned lots of useful things about wildfire from the game. Female and male interviewees 20 to 39 and both younger and older male interviewees most frequently reported that they learned a few useful things. Virtually no one indicated learning nothing from the experience (Figure 56). When asked, "Did the game make you want to learn more about the causes and affects of wildfire?" the interviewees in each age by gender grouping dispersed their responses widely. However, a majority of interviewees in each grouping answered "definitely yes" or "yes, more or less" in response to the question (Figure 57). Asked whether the game increased their awareness

of the importance of preventing wildfires, the great majority of interviewees in every grouping answered “definitely yes” or “yes, more or less”. The most affirmative responses came from females 40 or more (Figure 58). Asked whether the game made them want to learn more about what they can do to protect their home and surroundings from wildfire, the interviewees were fairly affirmative. Once again, the most affirmative responses came from females 40 or more. The least affirmative responses were given by the older males (Figure 59). Concerning whether changes in the game were warranted, those that responded offered a variety of suggestions. Most frequently, they proposed more questions or more challenging questions. Also frequently mentioned were the interrelated notions of making it more active, more interactive, and more appealing to kids. Several interviewees also noted that some of the words were off the edge of the screen (Table 29).

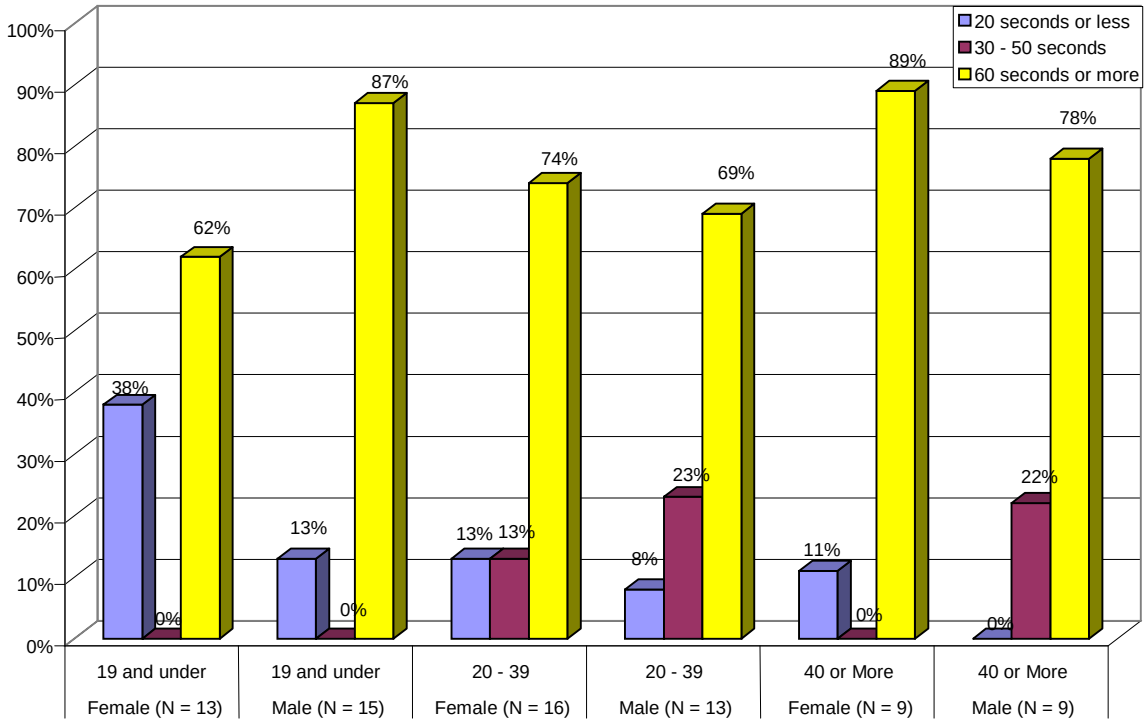
Dare to Enter the Forest Tables and Figures

Table 27

Number of Observations on Dare to Enter the Forest, by Gender and Approximate Age

Approximate Age	Gender	No.	%
19 and Under			
	Females	13	
	Males	15	
Subtotal		28	(37)
20 – 39			
	Females	16	
	Males	13	
Subtotal		29	(39)
40 or More			
	Females	09	
	Males	09	
Subtotal		18	(24)
Total		75	(100)

Dare to Enter the Forest
Figure 51. Duration of Engagement by Gender and Approximate Age



Dare to Enter the Forest
Figure 52. Visitor Action by Gender and Approximate Age

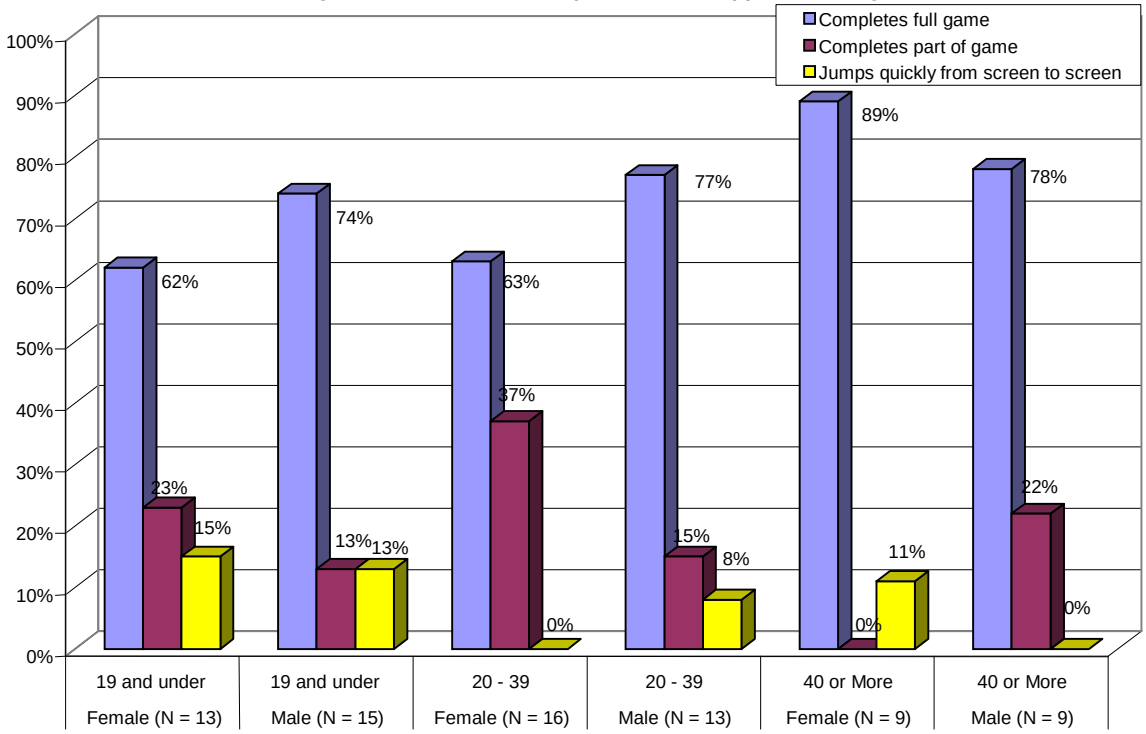
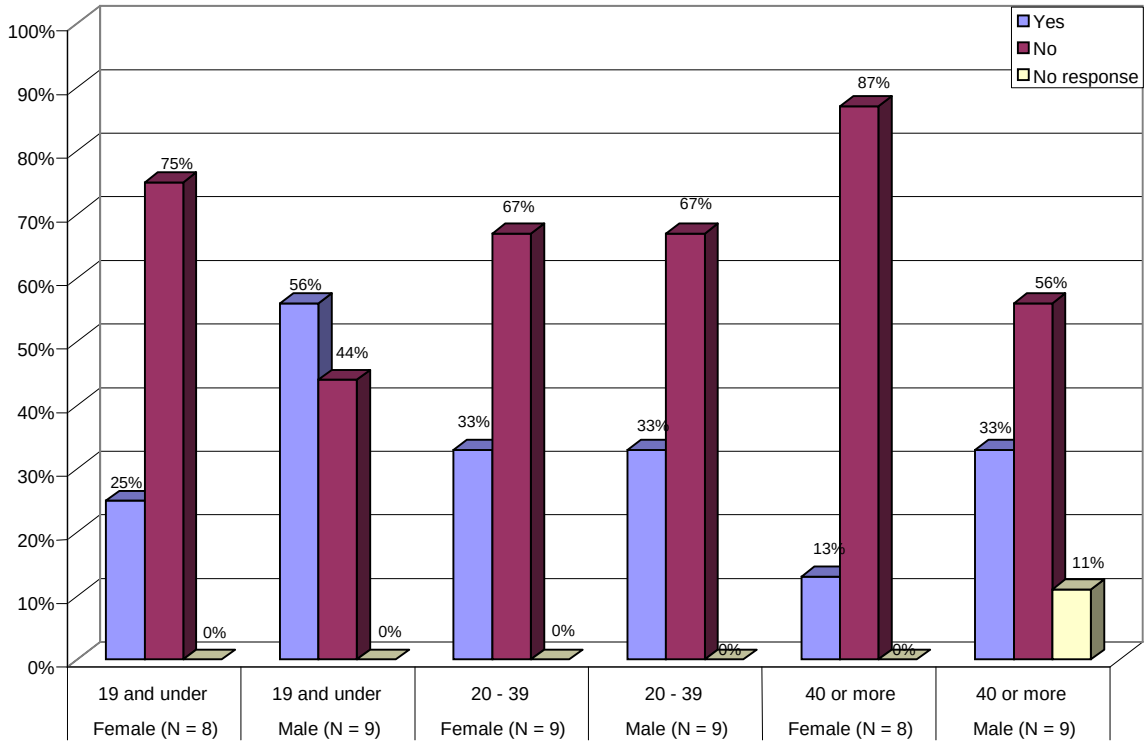


Table 28

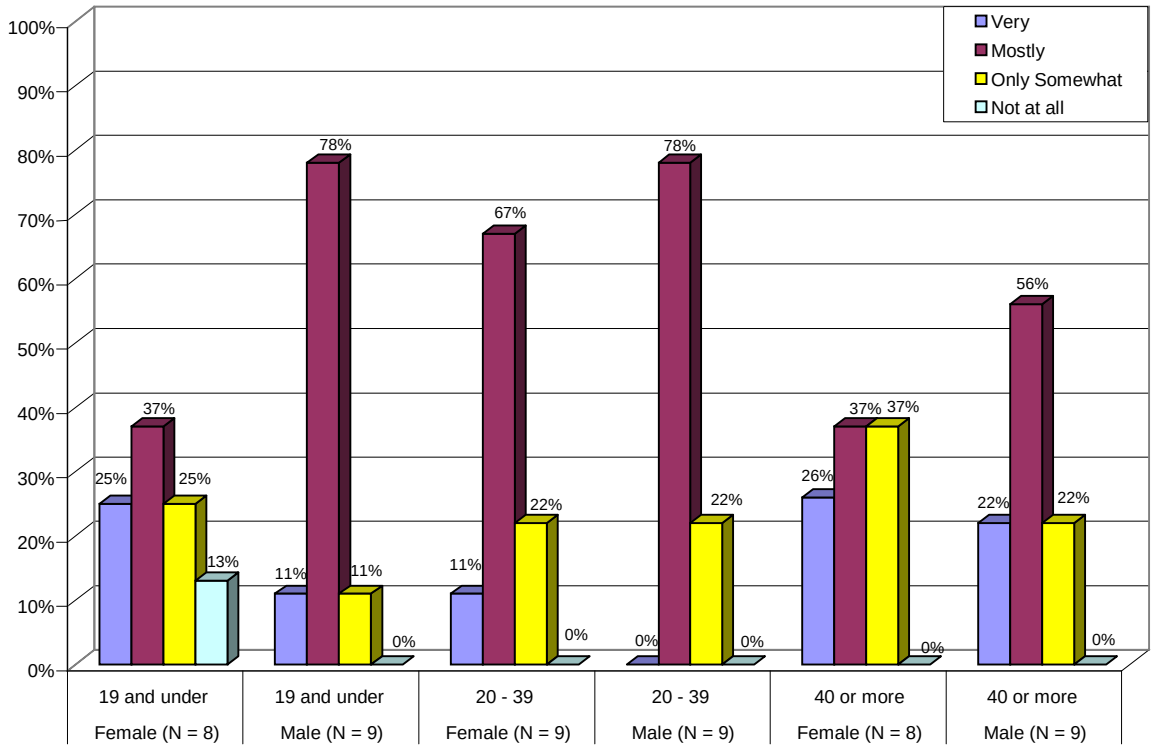
Visitor Reactions to Dare to Enter the Forest, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	08	
	Male	09	
Subtotal		17	(33)
20 – 39			
	Female	09	
	Male	09	
Subtotal		18	(34)
40 or More			
	Female	08	
	Male	09	
Subtotal		17	(33)
Total		52	(100)

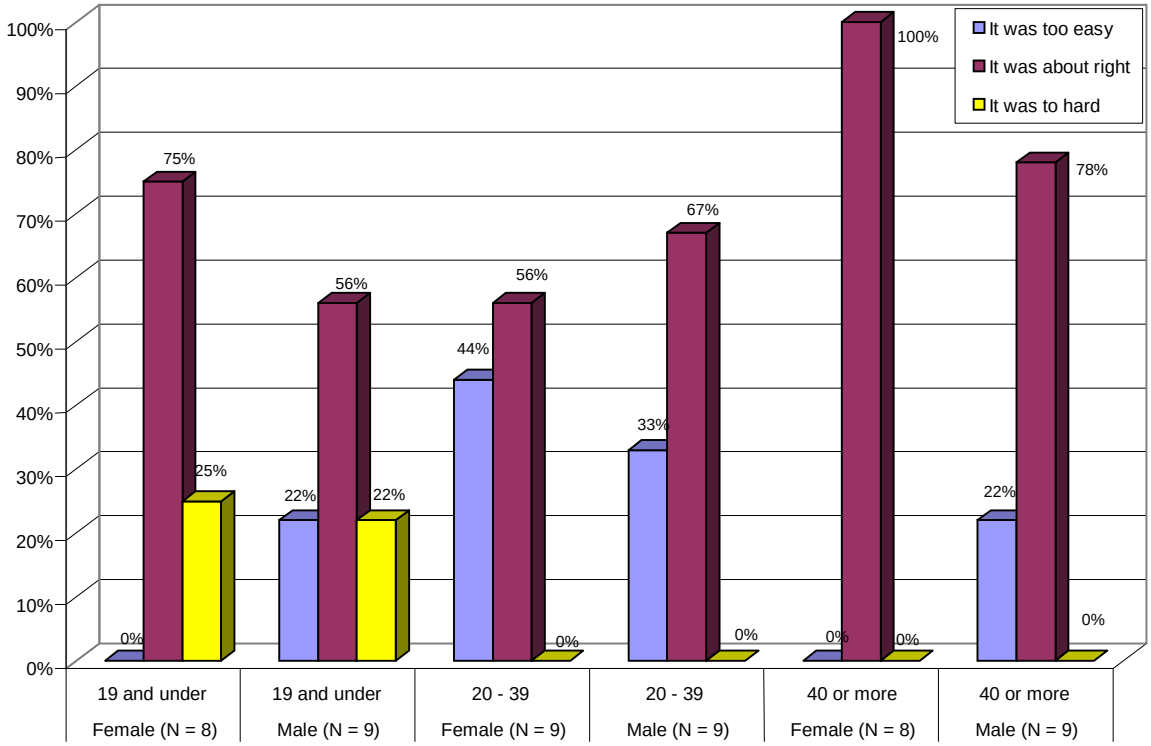
Dare to Enter the Forest
Figure 53. Do you live in or near a heavily wooded area?



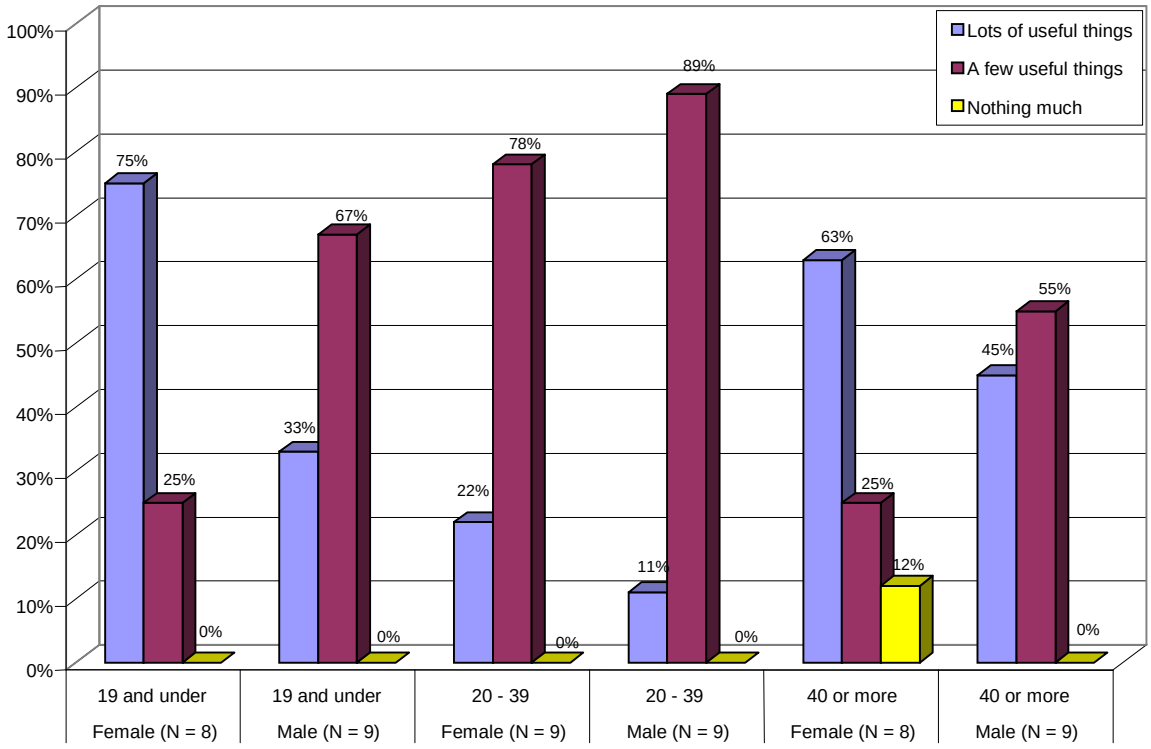
Dare to Enter the Forest
Figure 54. Was the wildfire game fun?



Dare to Enter the Forest
Figure 55. How easy or difficult was the game?

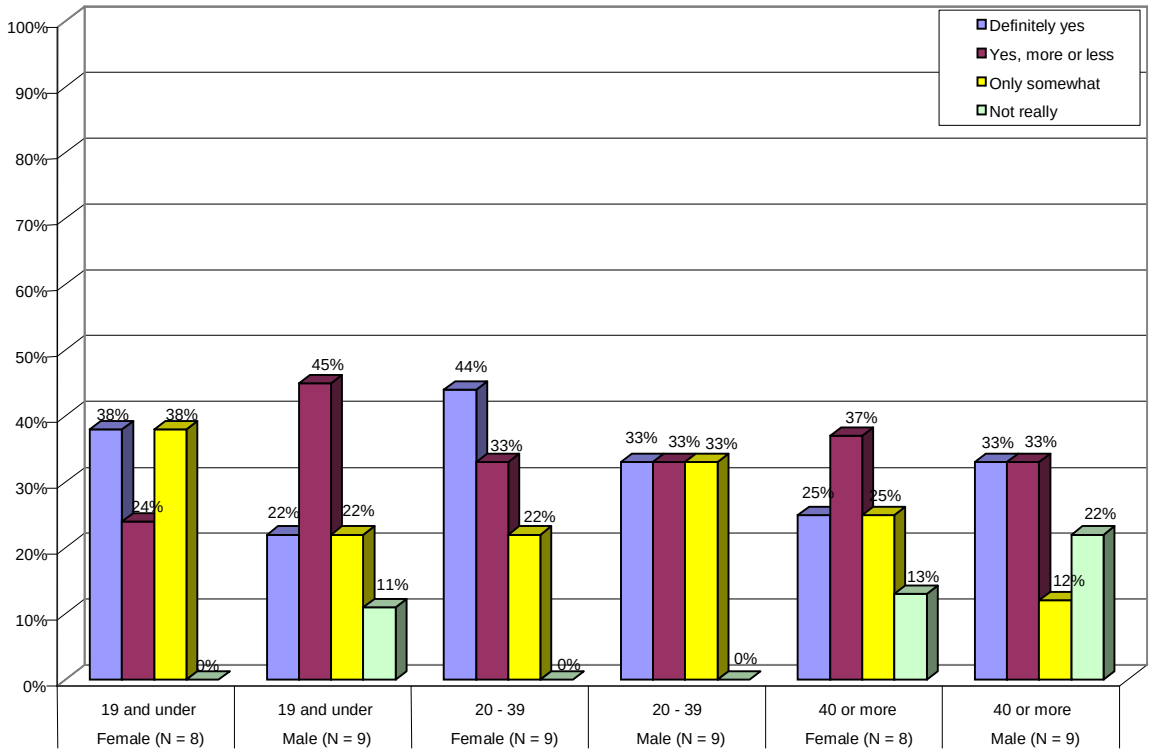


Dare to Enter the Forest
Figure 56. Did you learn some useful things about wildfire?



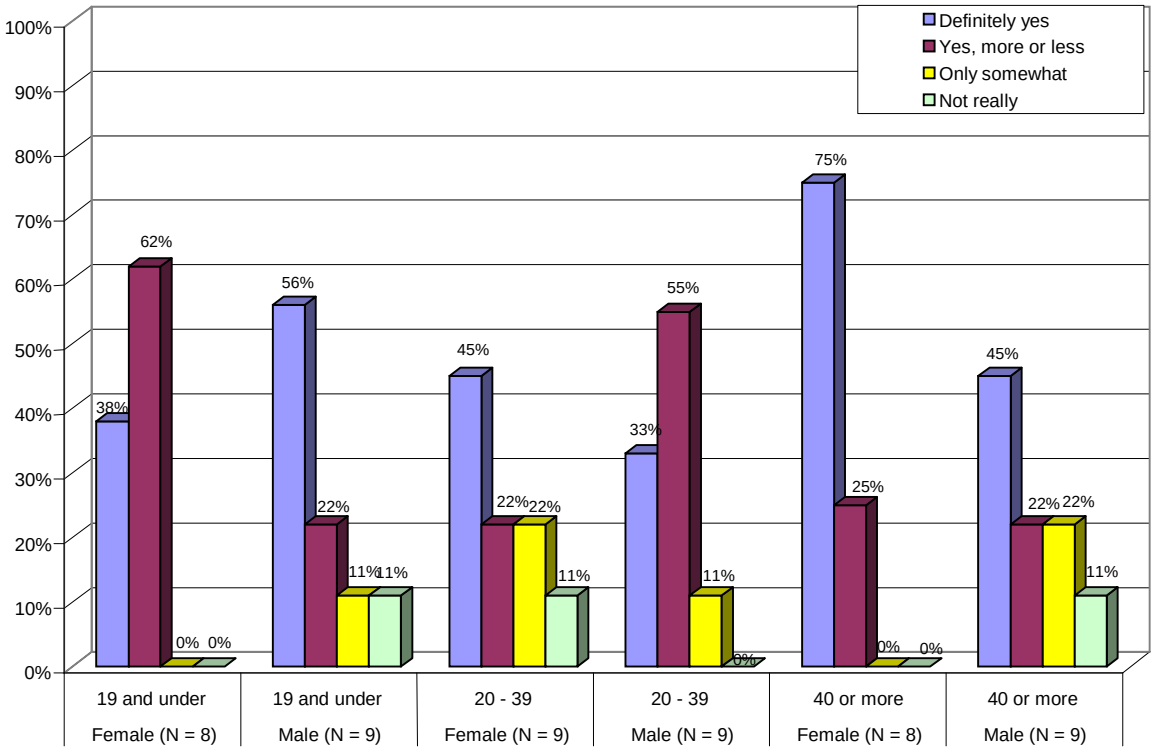
Dare to Enter the Forest

Figure 57. Did the game make you want to learn more about causes and affects of wildfire?



Dare to Enter the Forest

Figure 58. Did the game increase your awareness of the importance of preventing wildfires?



Dare to Enter the Forest

Figure 59. Did the game make you want to learn more about what you can do to protect your home and surroundings from wildfire?

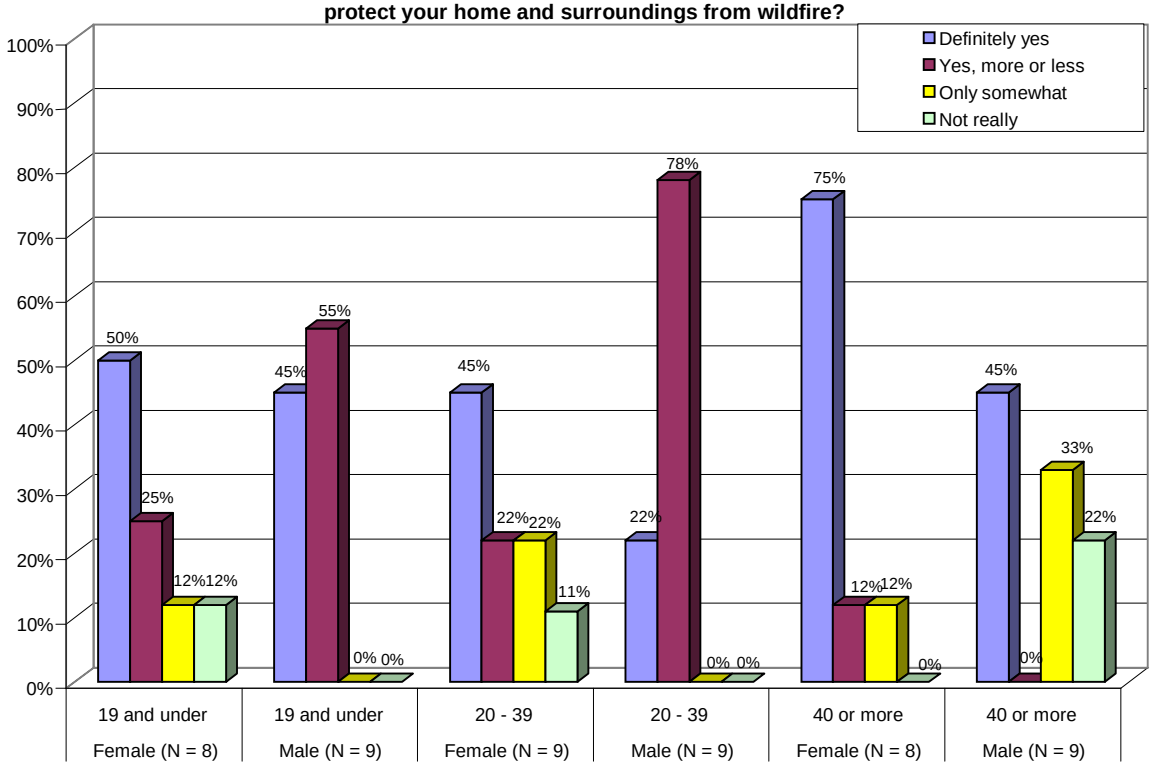


Table 29

What changes, if any, would make the more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• More action, it was boring • The graphics were pretty cool • Make it a little easier • Some of the answers were off the bottom of the screen • Have more questions
	Male	• Some of the words were off the bottom of the screen • Ok as is; can help a lot of people learn • Make it more interactive • Add more questions • Make it multiple choice so it is more challenging • Make the questions multiple choice • More questions
20 – 39		
	Female	• Add some sound effects • More interactive • Make the questions harder • More graphics • Make it multiple choice – or add multiple choice questions • Add moving graphics or video of fires or paratroopers dropping down onto a fire • Make it so that it appeals to very young kids – It's more for the older kids
	Male	• Add more challenging questions • Make the questions more difficult • Have harder questions • Remove the skull and crossbones – too much for say six year olds
40 or More		
	Female	• Make it a few questions longer • Add some comedy to it • Have more challenging questions
	Male	• Some words were off the screen • It was ok except for the fact that some of the information was off the edge of the screen • Add an audio so the questions can be heard by kids who can't read well • Make it harder; add sound

Visitor Reactions to Disasterville's Fire-Safe House Game

Introduction

Visitors playing the Fire-Safe House game in Disasterville were observed and interviewed by the evaluators regarding their experience with the game. An observation protocol was used to unobtrusively observe visitor interactions with the game and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 98 visitors varying in age and gender were observed playing the game, and a total of 60 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who completed the game. The data were collected between December 26, 2006 and January 13, 2007.

Using touch screen technology, the Fire-Safe House game allows the player to selectively remove trees, shrubs, dead leaves, and other potential fuel for wildfires from around a home. The player can activate the appearance of fire icons dispersed around the image of the home, and these fire icons disappear as the player begins the removal process. Once all fuel sources are removed, the player is provided with a congratulatory statement, signifying a successful performance. The game kiosk can comfortably accommodate one or two visitors at a time.

Summary of Results

Observations

Based on unobtrusive observations, the duration of visitor engagement with the Fire-Safe House wildfire game was typically less than a minute for visitors in the various age by gender groupings. Visitors in the female 40 or more grouping spent comparatively less time with the

game than others, typically 20 seconds or less. The male 20 to 39 grouping was the only one in which a majority of respondents engaged the game for a minute or more (Figure 60). Visitor

action with the game tended to show a distinct age pattern. All visitors in the 40 or more age grouping and an overwhelming majority of those 20 to 39 completed the full removal sequence. On the other hand, a noticeable minority of those 19 and under completed only part of the removal sequence (Figure 61).

Interviews

A distinct majority of interviewees in all age by gender groupings stated that they did not live in or near a heavily wooded area (Figure 62). The question, "Was the game fun?" drew widely varying responses from the interviewees. The most positive response came from females 19 and under, with almost two-thirds saying it was "very" fun. Adult interviewees tended to characterize it as "mostly" fun (Figure 63).

Learning and Perceptions

Asked if the game made them want to learn more about the causes of wildfire, the interviewees gave responses that varied by both age and gender. In general, those 19 and under and those 20 to 39 tended to be more affirmative in their responses than the older adults. More interestingly, within each age grouping, females tended to be more affirmative in their responses than males (Figure 64). On the other hand, responses to the question "Did the game increase your awareness of the importance of preventing wildfires?" showed no age or gender patterns. Interviewees, regardless of age or gender, were generally affirmative in their responses to the question. The least affirmative were females 40 or more (Figure 65). When asked, "Did the game make you want to learn more about what you can do to protect your home and surroundings from wildfire?" interviewees again responded in a generally affirmative manner. However, differences by age were discernable. Those 19 and under were the most affirmative in

their responses. Females 40 or more were again the least affirmative (Figure 66). Asked what changes they would suggest to make the game more enjoyable or informative, the interviewees

gave widely varying answers. The most frequent suggestion concerned adding instructions or explanations to clarify the purpose or the message of the game. Another frequently occurring idea was to make the game more exciting, either by making the fire more realistic or by having the house catch fire (Table 32).

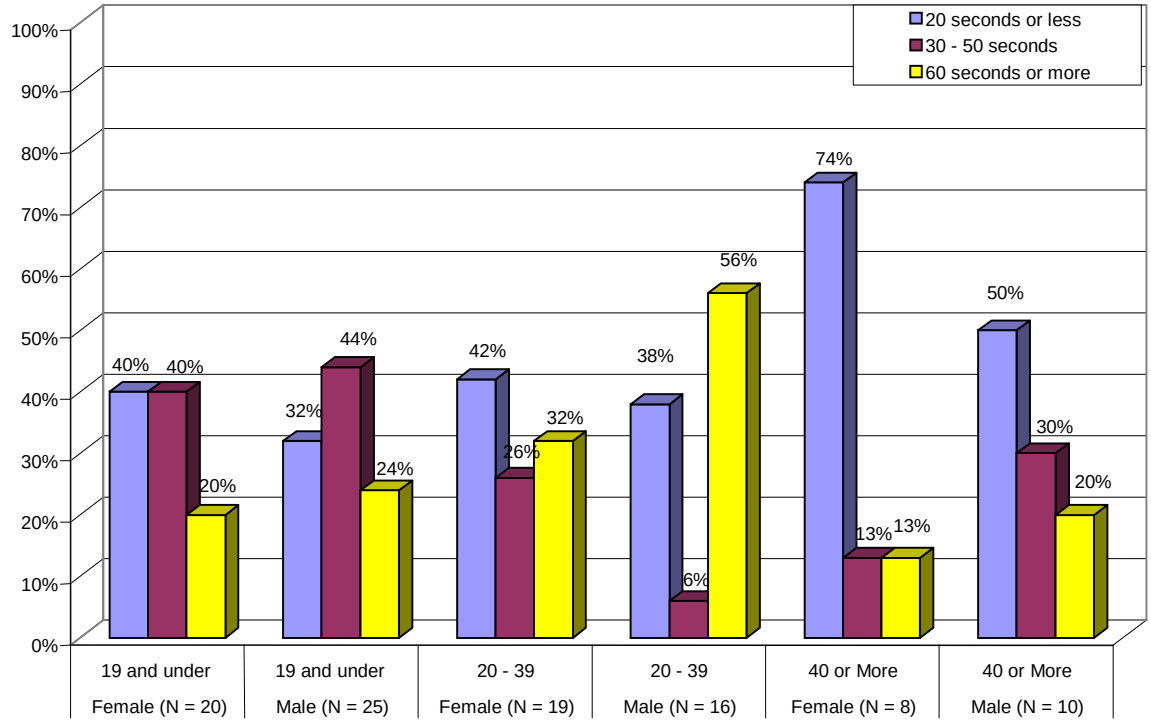
Fire-Safe House Tables and Figures

Table 30

Number of Observations on Fire-Safe House, by Gender and Approximate Age

Approximate Age	Gender	No.	%
19 and Under			
	Females	20	
	Males	25	
Subtotal		45	(46)
20 – 39			
	Females	19	
	Males	16	
Subtotal		35	(36)
40 or More			
	Females	08	
	Males	10	
Subtotal		18	(18)
Total		98	(100)

Fire-Safe House
Figure 60. Duration of Engagement by Gender and Approximate Age



Fire-Safe House
Figure 61. Vistor Action by Gender and Approximate Age

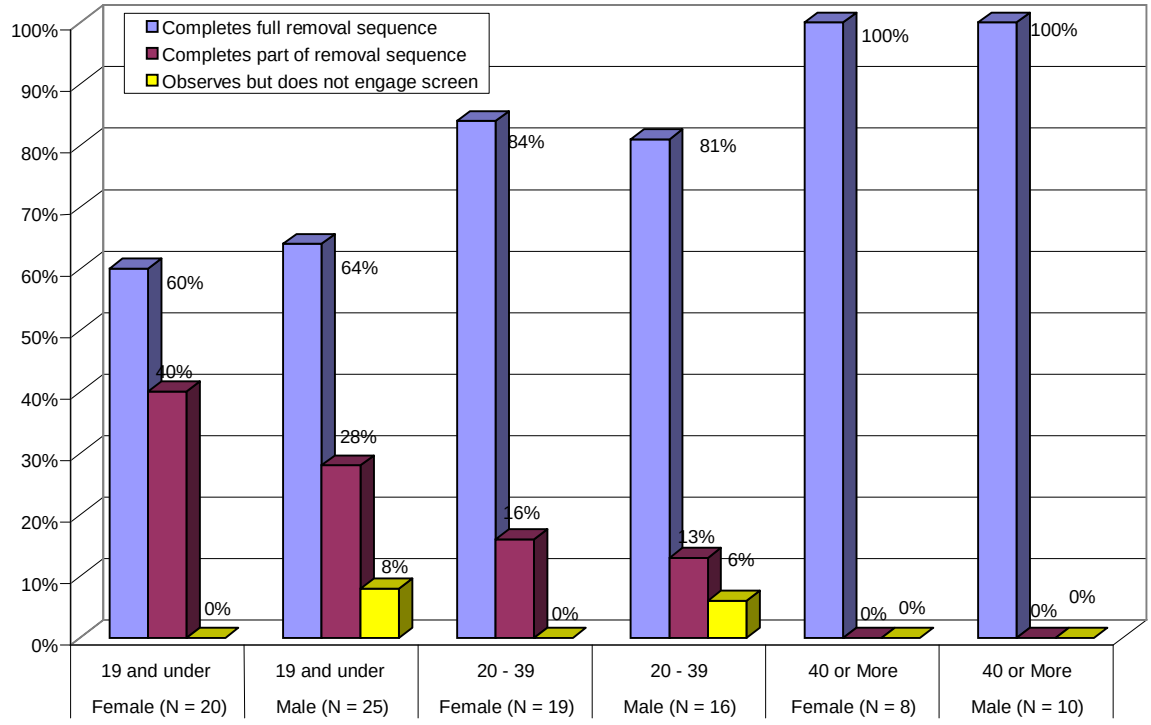
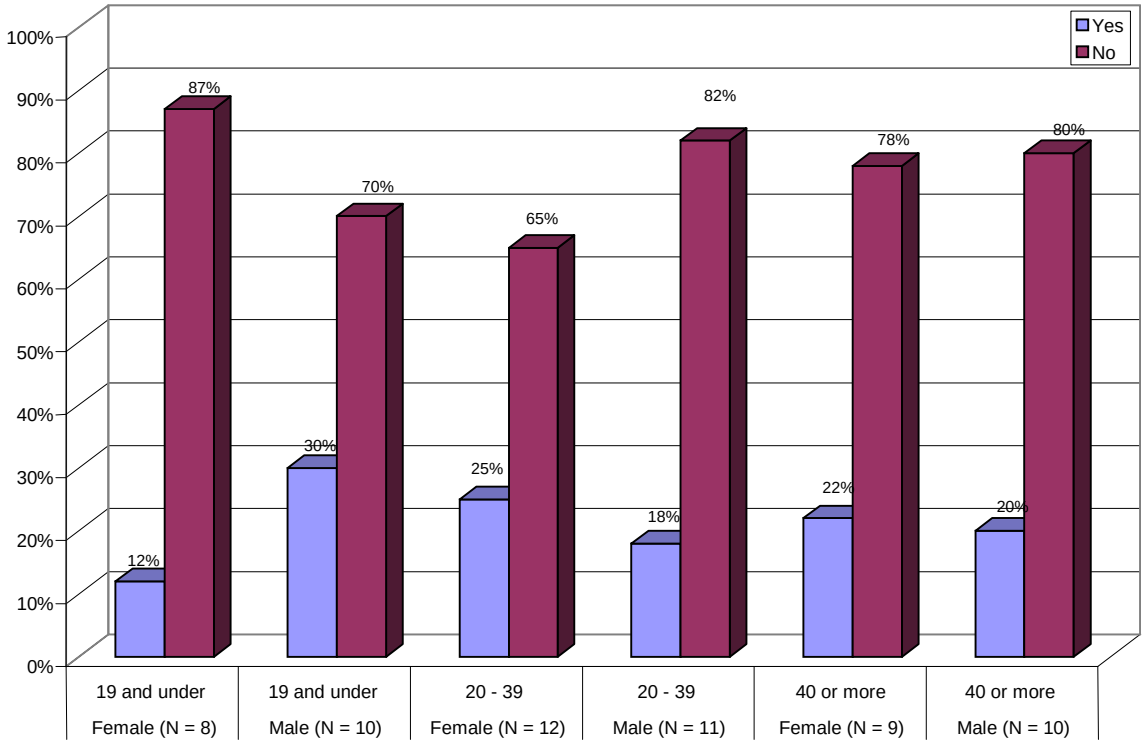


Table 31

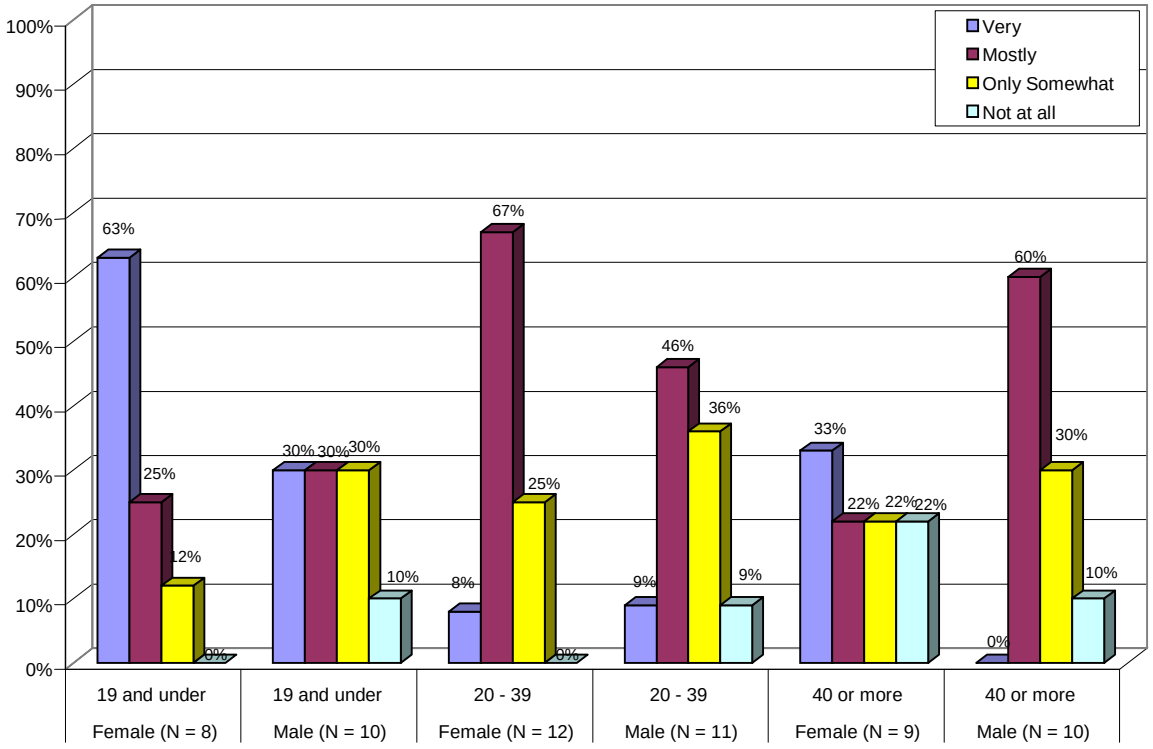
Visitors Reactions to Fire-Safe House, by Age and Gender

Age	Gender	No.	%
19 and Under			
	Female	08	
	Male	10	
Subtotal		18	(30)
20 - 39			
	Female	12	
	Male	11	
Subtotal		23	(38)
40 or More			
	Female	09	
	Male	10	
Subtotal		19	(32)
Total		60	(100)

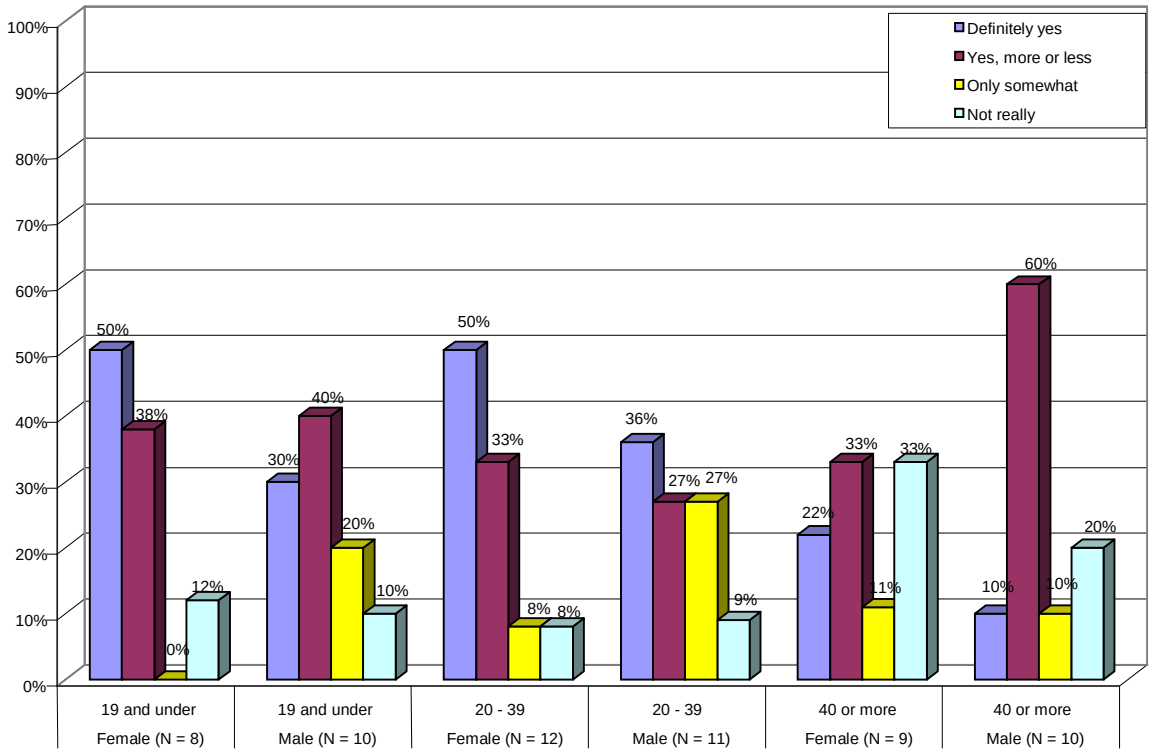
Fire-Safe House
Figure 62. Do you live in or near a heavily wooded area?



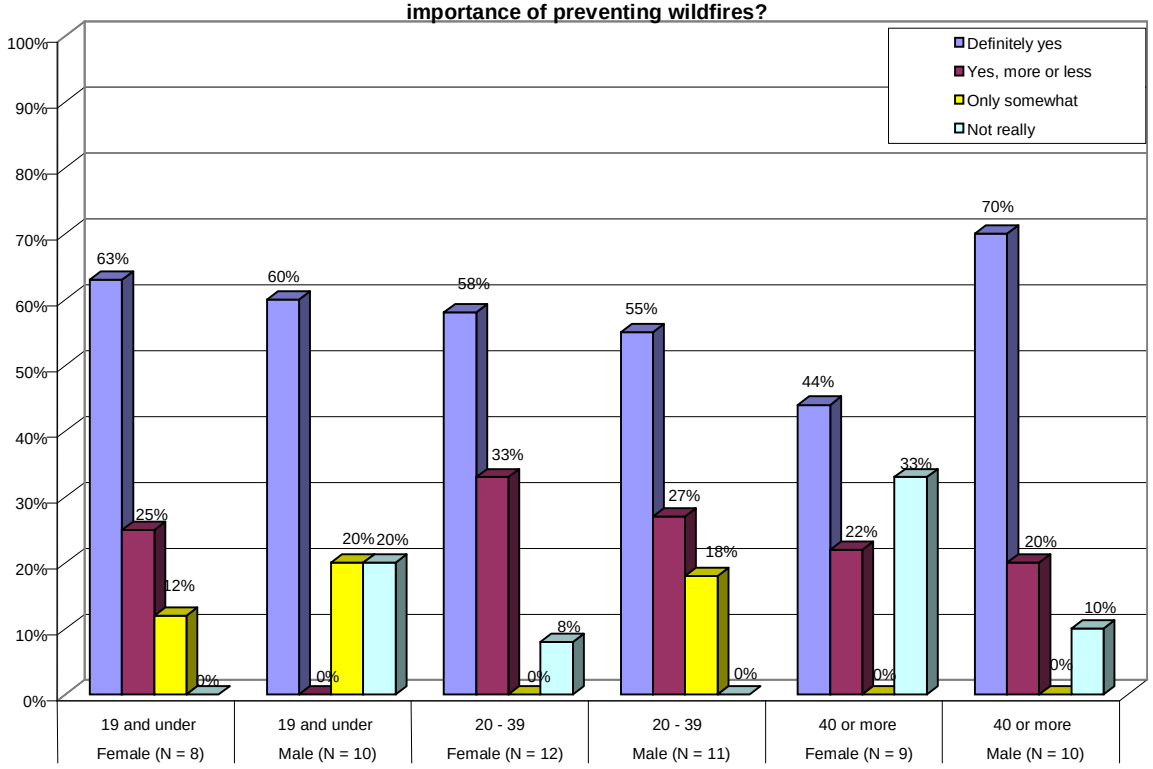
Fire-Safe House
Figure 63. Was the game fun?



Fire-Safe House
Figure 64. Did the game make you want to learn more about the causes of wildfire?



Fire-Safe House
Figure 65. Did the game increase your awareness of the importance of preventing wildfires?



Fire-Safe House

Figure 66. Did the game make you want to learn more about what you can do to protect your home and surroundings from wildfire?

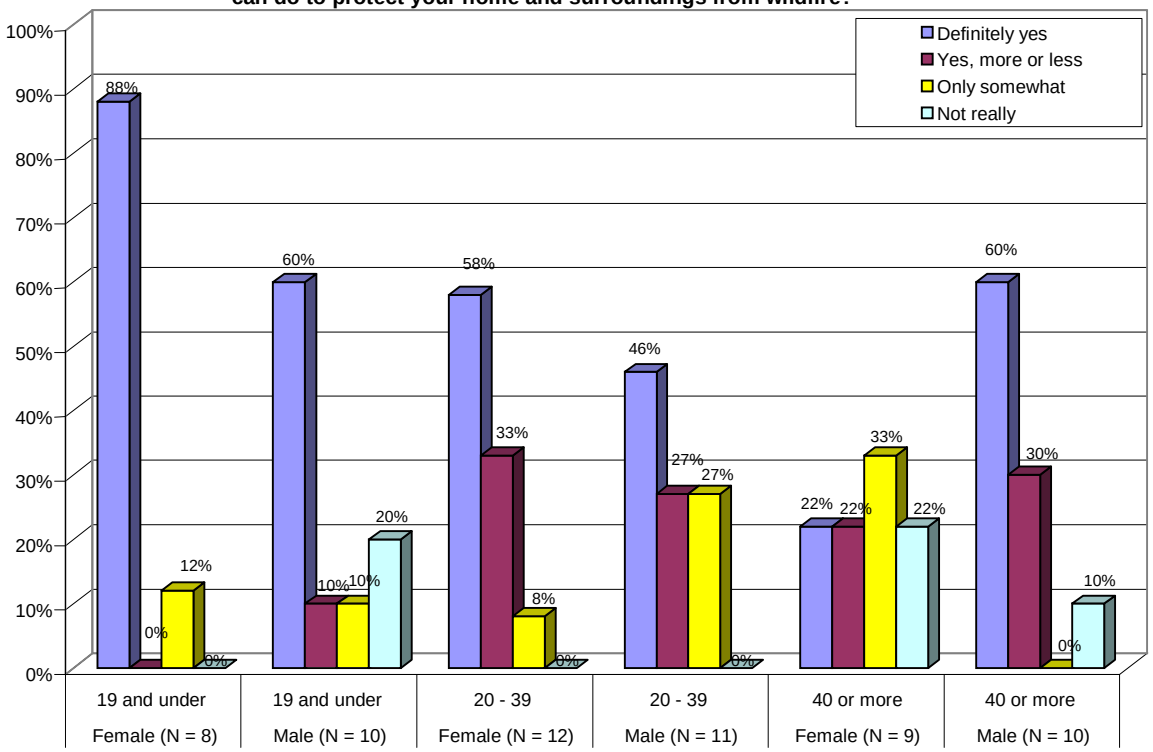


Table 32

What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• Add people to show how fires are started. • The point of the game is not clear
	Male	• Make fire scene more realistic • Add explanations as to why removing certain things reduces fire risk • More things to remove • Make the house burn down • Clarification on the purpose
20 – 39		
	Female	• Show how the fires can spread easily • Its too simple • Its too short, too quick • Have the house actually catch on fire – make it more exciting • Think it is fine as it is; teaches about what needs to be done to keep your house safe • Add more options • It would be nice if you could have different types of houses displayed. • Needs to explain more about the significance of removing certain things • Examples of city life
	Male	• Make it more realistic • How about city life? • I like it as is; the touch screen was easy to use • I like it – good for young kids • Make the fire more realistic • It's useful as it
40 or More		
	Female	• Needs to indicate the purpose of the game • Add a person in the house to give the game a since of urgency • It's simple and its clear – leave it as is • I don't know; I'm not clear on what its message is. • It needs to explain how far away the fire sources should be from the home.
	Male	• Add instructions • Add instructions, also add an audio of fire sounds • Maybe an introductory animation or instruction • Make the fire more realistic and more obviously a wildfire • Needs more explanation. The presentation seems to be oriented more to dry areas of the country, not wet areas. • No changes – like it as is, simple and straightforward

Visitor Reactions to *Disasterville*'s Flood Table

Introduction

Visitors to either side of the Flood Table in *Disasterville* were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 80 visitors varying in age and gender were observed interacting with the exhibit, and a total of 60 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who properly activated the exhibit and/or observed its activation. The data were collected between November 20 and 28, 2006.

The Flood Table is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It presents to the visitor a miniature river valley on one half of the table and a miniature waterfront town on the other half of the table. The two scenes are divided from each other so that they can be engaged separately. The half containing the waterfront town is covered by a transparent plastic shield. Signage directs the visitors to hold down a button that activates the buildup of flood water in the town; the longer the button is pressed, the higher the water rises into the town. On the river valley portion of the exhibit, signage directs the visitors to place miniature homes along the banks of the river, and observe which ones get flooded when they hold down a button that activates the flow of water in the river. The Flood Table stands about 30 inches off the floor. Each side of the table can accommodate several visitors at a time.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of visitor engagement with the Flood Table exhibit was long relative to that of many other *Disasterville* exhibits, ranging from less than 45 seconds to over three minutes. In each of the age by gender groupings, the typical amount of time visitors were engaged with the exhibit was between one and two minutes. The fairly lengthy duration of engagement was partially a reflection of the slow rate of water flow on both sides of the exhibit. Of all the visitors, those in the 20 to 39 grouping tended to spend the most time with the exhibit (Figure 67). The great majority of adult visitors engaged both sides of the Flood Table; relatively few adults stopped at one side only. On the other hand, visitors 19 and under were more likely to engage only one side; for females 19 and under, the river side of the exhibit was particularly popular (Figure 68).

Interviews

When asked whether they live near the water, most interviewees in the 20 to 39 grouping said yes. Most of the younger and older interviewees said no (Figure 69). Virtually all the interviewees, regardless of age or gender, reported that they found the Flood Table easy to understand and operate (Figure 70). Asked whether they found the exhibit to be fun and informative, the interviewees responded somewhat differently depending upon both age and gender. In general, those 19 and under and females 20 to 39 were somewhat more likely to characterize the exhibit as "very" fun and "very" informative. Those 40 or more and males 20 to 39 were somewhat less likely to characterize the exhibit as "very" fun or "very" informative (Figures 71 and 72).

Learning and Perceptions

Asked what message the Flood Table exhibit is trying to get across, virtually all interviewees identified the message as one concerned with the risks of flooding and the importance of building away from or above the water (Table 35). Asked if the exhibit made them curious about how floods can affect buildings and other structures, a majority of interviewees across all age by gender groupings responded "definitely yes" or "yes, more or less". The most positive responses came from males 19 and under and females 40 or more (Figure 73). When asked, "Does this experience make you want to learn more about how to protect your home from flood?" responses varied somewhat by age. The younger interviewees were generally the most affirmative, followed by the older interviewees. Those interviewees 20 to 39 were the least affirmative in response to the question (Figure 74). Given the opportunity to suggest changes that they believe would make the exhibit more enjoyable or more informative, the respondents focused almost exclusively on the water flow on each side of the exhibit. On the town side the suggestion was repeatedly given to increase the speed of the flooding. "It is too slow", said one. Similarly, on the river side, the same suggestion was offered—make the water flow faster and rise higher in the river bed (Table 36).

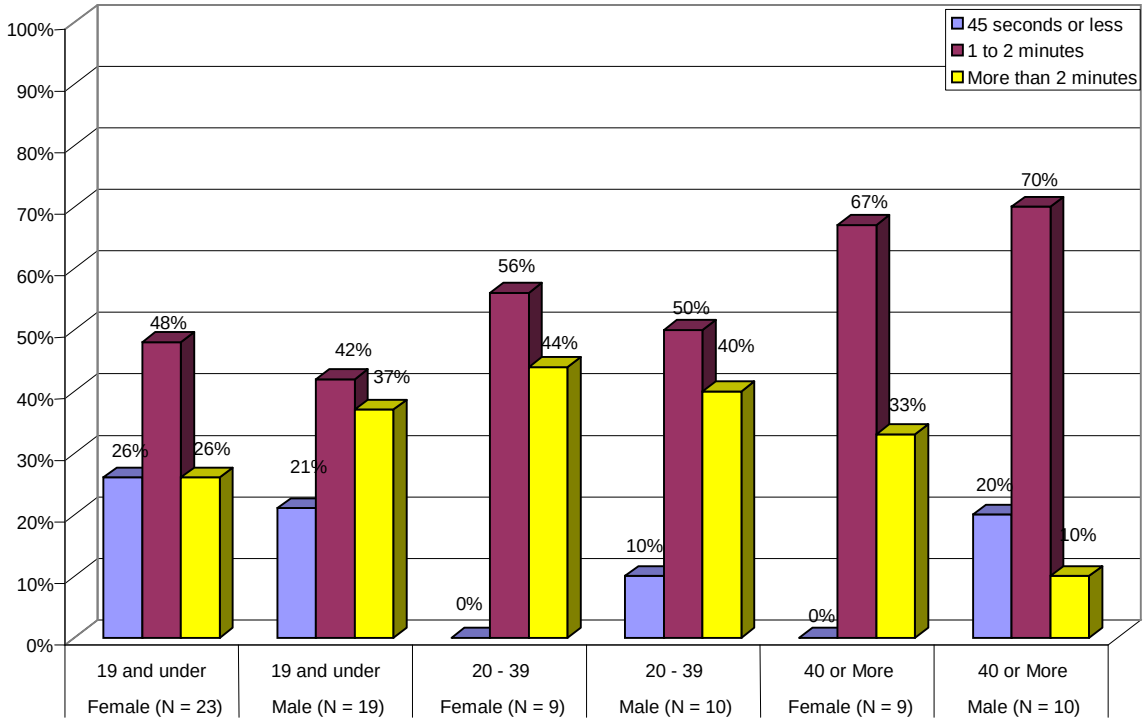
Tables and Figures for Flood Table

Table 33

Number of Observations for Flood Table, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	23	
	Male	19	
Subtotal		42	(52)
20 – 39			
	Female	09	
	Male	10	
Subtotal		19	(24)
40 or More			
	Female	09	
	Male	10	
Subtotal		19	(24)
Total		80	(100)

Flood Table
Figure 67. Duration of Engagement by Gender and Approximate Age



Flood Table
Figure 68. Visitor Action by Gender and Approximate Age

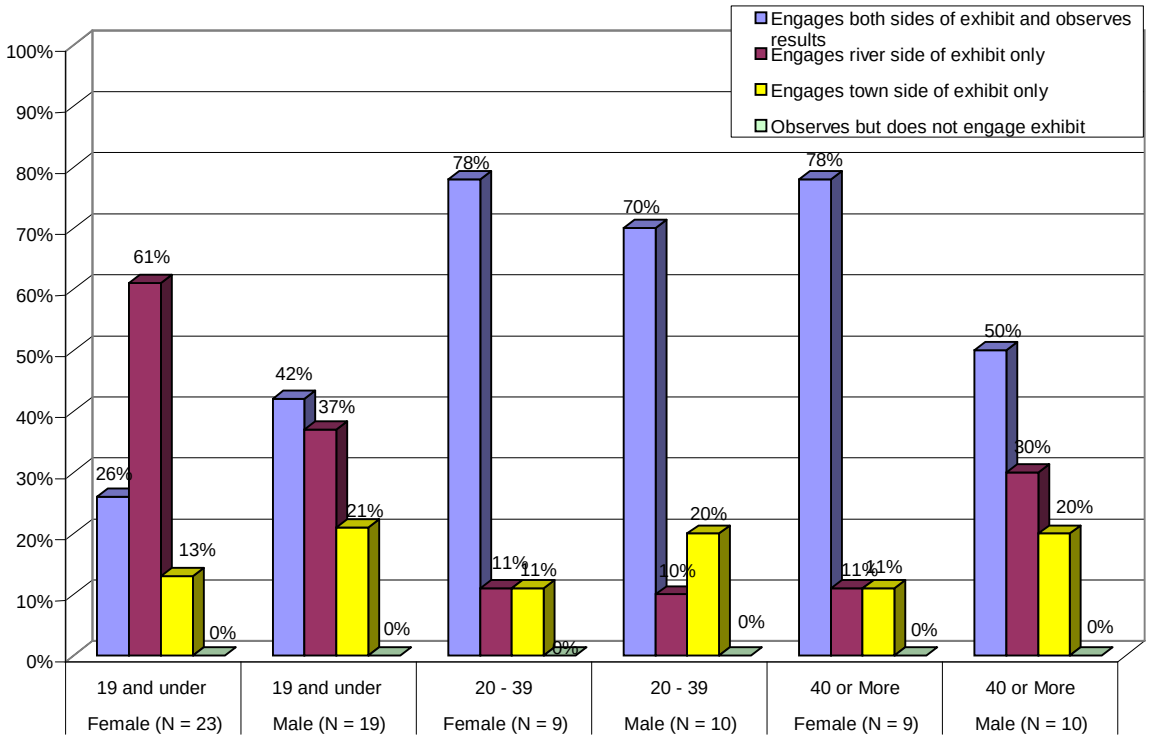
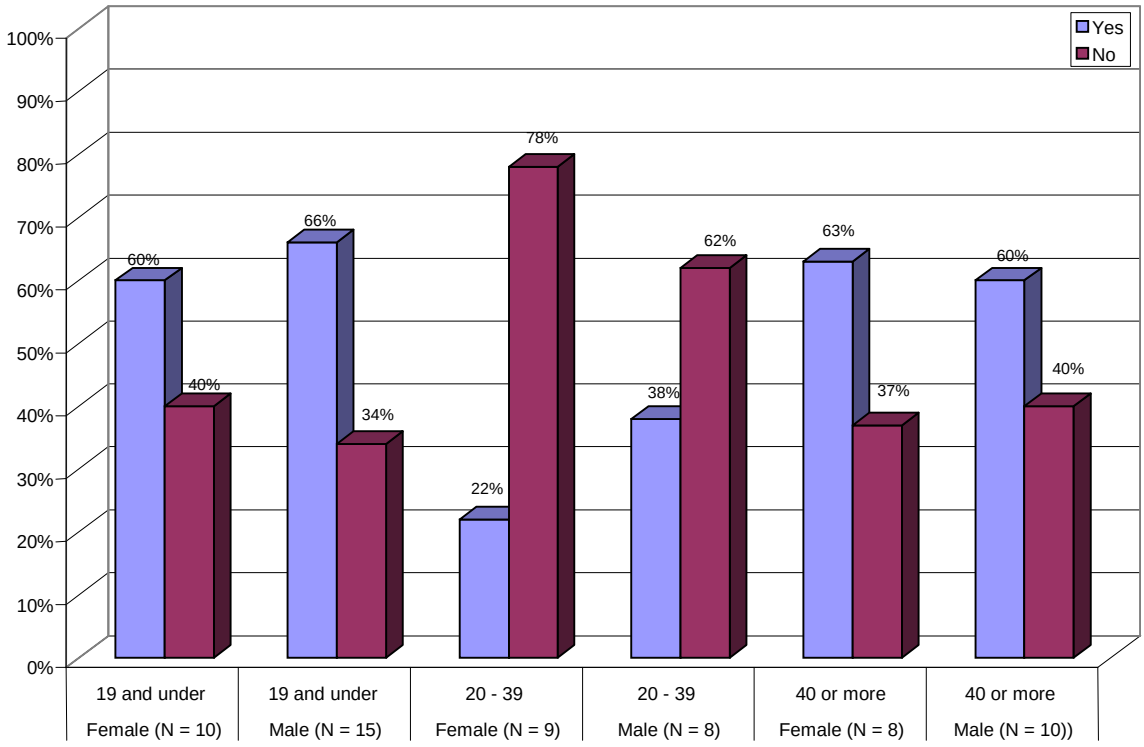


Table 34

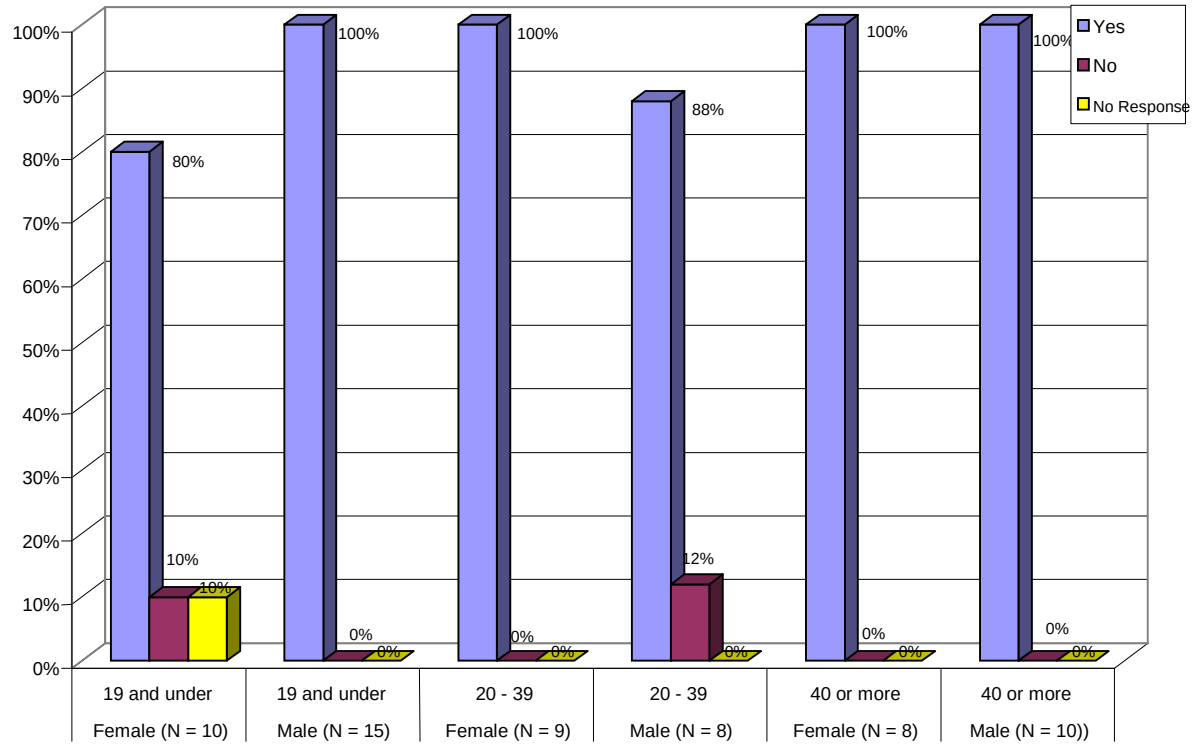
Visitor Reactions to Flood Table, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	10	
	Male	15	
Subtotal		25	(42)
20 – 39			
	Female	09	
	Male	08	
Subtotal		17	(28)
40 or More			
	Female	08	
	Male	10	
Subtotal		18	(30)
Total		60	(100)

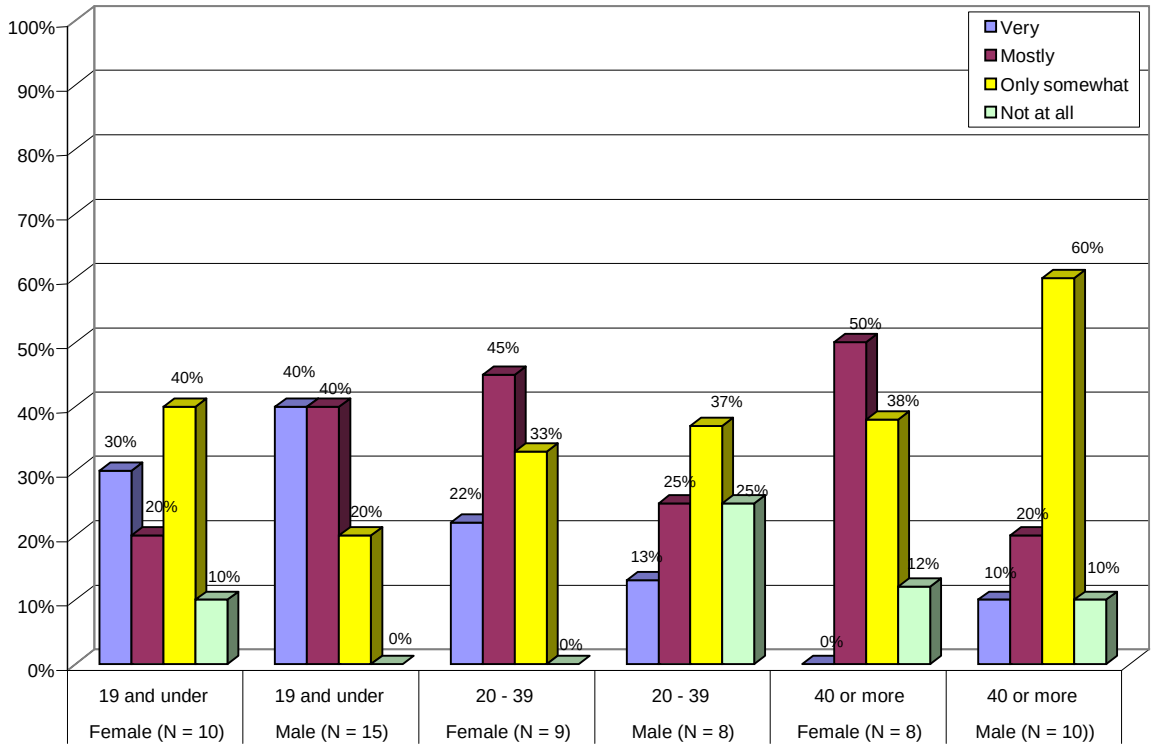
Flood Table
Figure 69. Do you live near the water?



Flood Table
Figure 70. Did you find this exhibit easy to understand and operate?



Flood Table
Figure 71. Did you find this exhibit fun?



Flood Table
Figure 72. Did you find this exhibit informative?

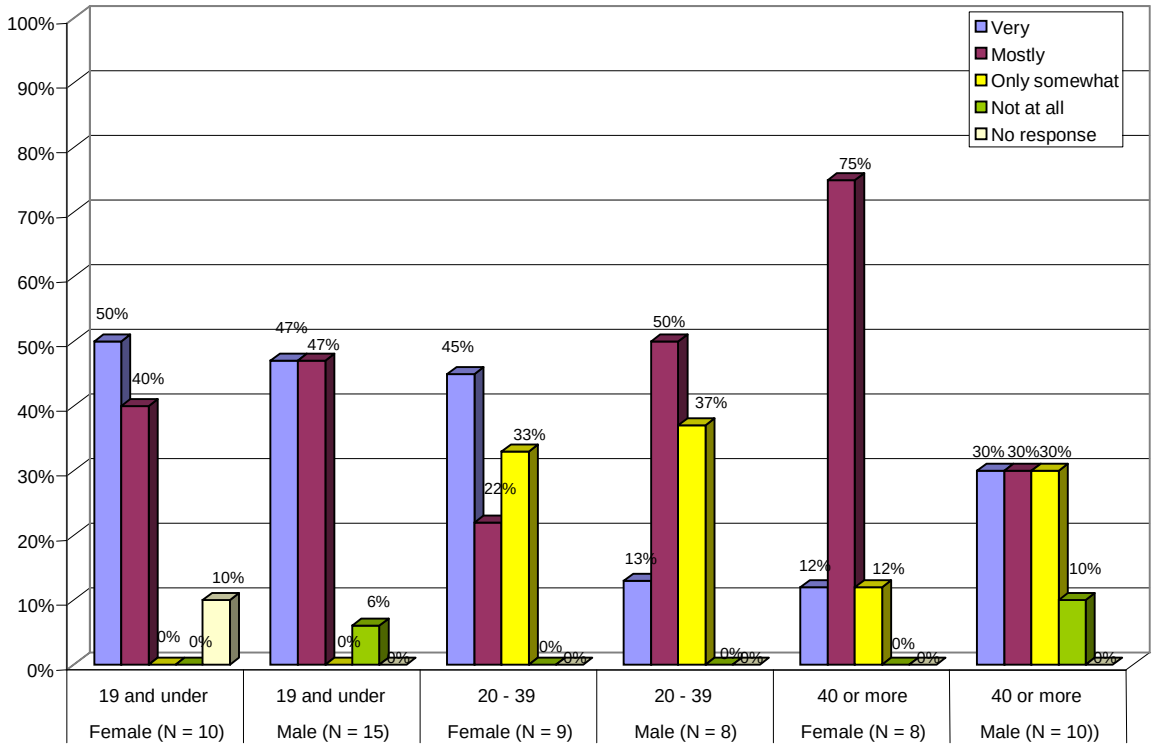


Table 35 **Flood Table**

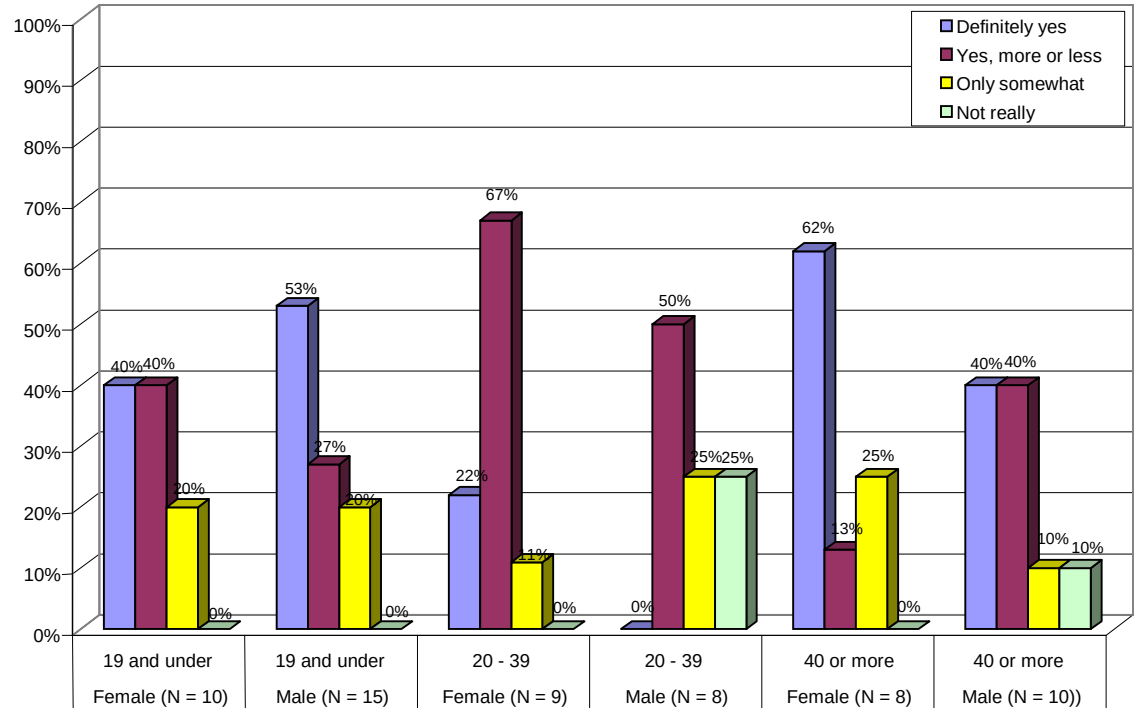
What message to do think this exhibit is trying to get across?

Age	Gender	
19 and Under		
	Female	• The danger of floods to a community • Know what flood zone you are in • Be prepared for flood • Flood waters are dangerous • How water can be dangerous • Protect you house from floods • Water can be dangerous • What floods can do • Do not build by the river
	Male	• Things on lower land get flooded first • What happens when a flood comes near you • Houses closest to water flood first • Low areas flood faster • Don't build near the river • Build houses on high ground • If you build in low areas you get flooded • Build houses high • Make sure you build your houses on higher ground • Houses get flooded when they are near the water • Houses high and out of low lying areas • The seriousness of flooding • You can't live near the water • Flooding damage
20 – 39		
	Female	• Not sure • Dangerous storms • How elevation of water can ruin homes • Don't build close to the water • How buildings are affected by floods • Closer to water more dangerous • Dangers of flooding • Flooding can be serious near the water • To build high if you live near the water
	Male	• Make sure your house is build on high ground • Not sure • Don't build close to the water • Water's disastrous abilities • The nearer the beach the sooner house floods • Low lying houses get flooded • Don't live near the water
40 or More		
	Female	• Not sure of message • Water evaluation and possible flooding • Locate of houses/buildings. Be careful where you put them • During flood disaster – what floods first • Do better conservation! Watch where we build • Help to understand floods • Build high • Build your house high above the water line

Table 35 (continued) **Flood Table**

	Male	• Effects of flooding • Don't go near water • Build your house on high ground • Flood water damage • Flood damage possibilities • Construction of houses and buildings should be high • Flood plains – water effect • Build high and dry • How the coast can flood • Flooding can take out coastal property

Flood Table
Figure 73. Does this exhibit make you curious about how floods can affect buildings and other structures?



Flood Table
Figure 74. Does this exhibit make you want to learn more about how to protect your home from flood?

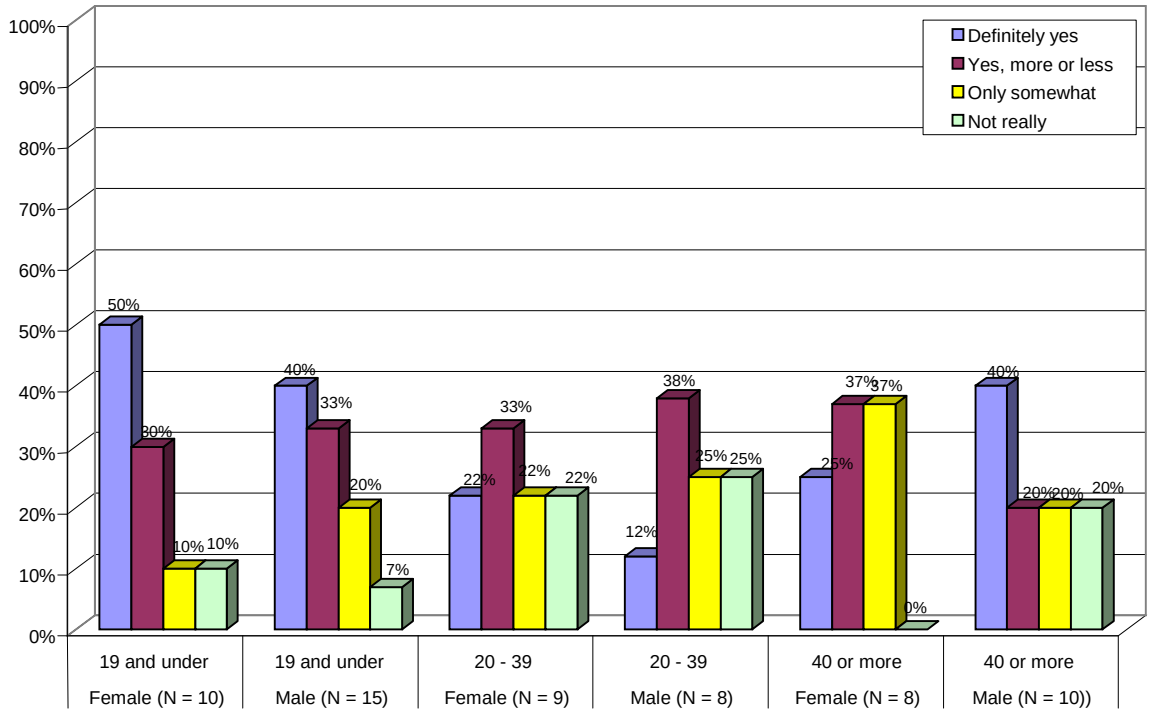


Table 36

What changes, if any, would make the exhibit more enjoyable or more informative?

Age	Gender	
19 and Under		
	Female	• Have water rise faster (town side) • Stronger current (river side) • Make it quicker – the water • The water takes too long to flood (town side) • Flood quicker and have things that float • Let it show the damage possible • Water takes too long to flood (town side) • Make water rise higher (river side) • Light up houses that get flooded
	Male	• Put drain higher/flood faster • Add something more than just houses (river side) • Flood faster (town side) • Make water flood a little faster (town side) • Put in more water (town side) • Make water flow faster (river side) • Make the water rise higher (town side) • More water (town side) • Water should flow faster and rise higher (river side) • Water is too slow (town side) • Fix the water speed (town side) • Better speed on water (town side)
20 – 39		
	Female	• Make the exhibit more exciting • Increase water speed. Make signs to explain exhibit • Water too slow – make more realistic (town side) • More movement of the houses (river side) • Add the different levels of hurricanes – or flood levels. • Lower the table so kids can see it better
	Male	• Doesn't work well without water flowing faster (town side) • Add more water to the exhibit and water level information • Faster flooding (town side) • It is too slow (town side) • Add some lightning flashes for effect • Have the water flow with more force—more dramatic (river side)
40 or More		
	Female	• Water flows too slowly and weakly; needs to rise higher in the river bed (river side) • What is sea level? Have elevation table – signs • Too slow (town side) • Add small boats (river side) • Make the water a color-–It was difficult to see (town side) • Need more water. • Make the water rise faster (river side) • Color the water so you can see the water rising (town side)

	Male	• Add wind. Also, water flows too slowly (town side) • More water on both sides • Have the water more dramatic (river side) • Water is too slow • Add sound and information on water levels • Combine wind to the town side for a better effect of high tides. Add elevation to the river side, elevation markers • Make water faster on both sides • Layering of contours should be reversed • Get the water to drain out faster (town side) • Water needs to drain faster, so when next person comes, there won't be standing water (town side)

Visitor Reactions to *Disasterville*'s L.I.D.A.R.

Introduction

Visitors to the L.I.D.A.R exhibit were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 90 visitors varying in age and gender were observed interacting with the exhibit, and a total of 58 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who activated the exhibit; those who only observed were not interviewed. The data were collected between December 2 and 23, 2006.

The L.I.D.A.R. is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It presents to the visitor a large enclosed table on which is displayed a photographic map of the city of Tampa. The visitor is provided with two video screens, a joystick and a series of buttons. By manipulating the joystick, the visitor can position a small video cam over any part of the city map, thereby displaying that portion of the map on one of the two video screens. The other video screen shows the same segment of map as a topographical image. By manipulating the series of buttons next to the joystick, the visitor can see the impact of rising water on the map images being displayed. The indicated water level can be increased in 5-foot increments up to a maximum of 30 feet. The exhibit can be fully activated by only one visitor at a time.

Summary of Results

Observations

Based on unobtrusive observations, the duration of visitor engagement with the L.I.D.A.R exhibit was typically 30 seconds or more and often one minute or more. The evaluators observed several visitors spending in excess of 3 minutes with the exhibit. Males 19 and under and females 20 to 39 tended to spend more time with the exhibit than other visitors (Figure 75). Most visitors who stopped at the L.I.D.A.R fully engaged the exhibit (working both the joystick and the storm surge buttons). However, a significant percentage of the visitors were content to activate only the joystick, either ignoring or failing to notice the storm surge buttons. This was especially the case for visitors who were19 and under and visitors who were 40 or more. Also, a noticeable percentage of the females in the 40 or more category tended to observe only (Figure 76).

Interviews

Most of the visitors who were interviewed reported that they live near the water. This was particularly true of those in the 20 to 39 age category (Figure 77). When asked, "Did you find this exhibit easy to understand and operate?" almost all interviewees in the 19 and under and 20 to 39 age categories responded "yes". However, a noticeable percentage of those in the 40 or more category responded negatively (Figure 78). Asked what was the problem, they tended to cite difficulties with the joystick or confusion about the nature or purpose of the exhibit (Table 39). A majority of the interviewees across all age by gender categories characterized the exhibit as "very fun" or "mostly fun", with the most positive responses coming from those who were 19 and under (Figure 79). When asked whether they found the exhibit to be informative, the interviewees differed more noticeably by age or gender categories. Again, 19 and under interviewees were the most positive in their responses. Female interviewees age 40 or more were clearly the least positive (Figure 80). Almost all of the interviewees seemed clear as to the

message of exhibit. They cited storm surge, flooding or a related problem as the focus of the exhibit (Table 40).

Learning and Perceptions

When asked, "Does this exhibit increase your awareness of the problem of storm surge from hurricanes?" the responses were strongly affirmative across all categories of respondents, with the exception of males 40 or more (Figure 81). When asked, "Does this exhibit make you want to learn more about storm surge and its affects?" the responses were affirmative across most categories of respondents. However, a noticeable percentage of older interviewees responded negatively (Figure 82). When the interviewees were asked, "What changes, if any, would make the L.I.D.A.R. exhibit more enjoyable or more informative?" the most frequent suggestions included making the joystick easier to control, enabling the camera to zoom in and out on an image, and adding operating instructions (Table 41).

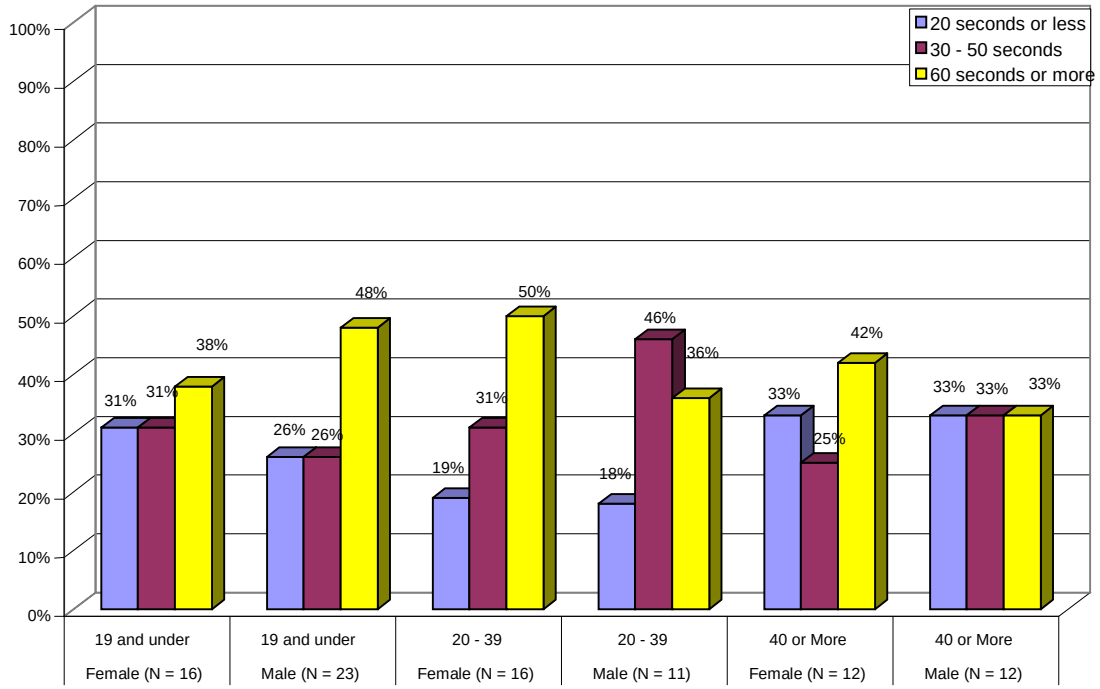
L.I.D.A.R. Tables and Figures

Table 37

Number of Observations for L.I.D.A.R., by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	16	
	Male	23	
Subtotal		39	(43)
20 – 39			
	Female	16	
	Male	11	
Subtotal		27	(30)
40 or More			
	Female	12	
	Male	12	
Subtotal		24	(27)
Total		90	(100)

L.I.D.A.R. Exhibit
Figure 75. Duration of Engagement by Gender and Approximate Age



L.I.D.A.R. Exhibit
Figure 76. Visitor Action by Gender and Approximate Age

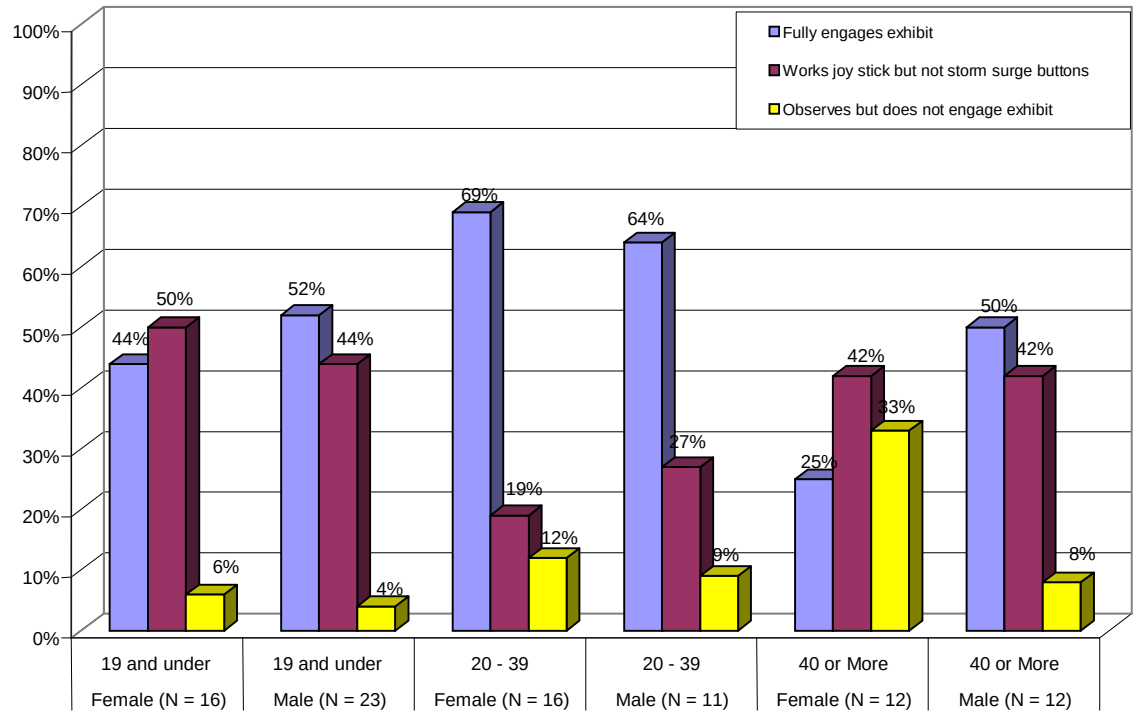
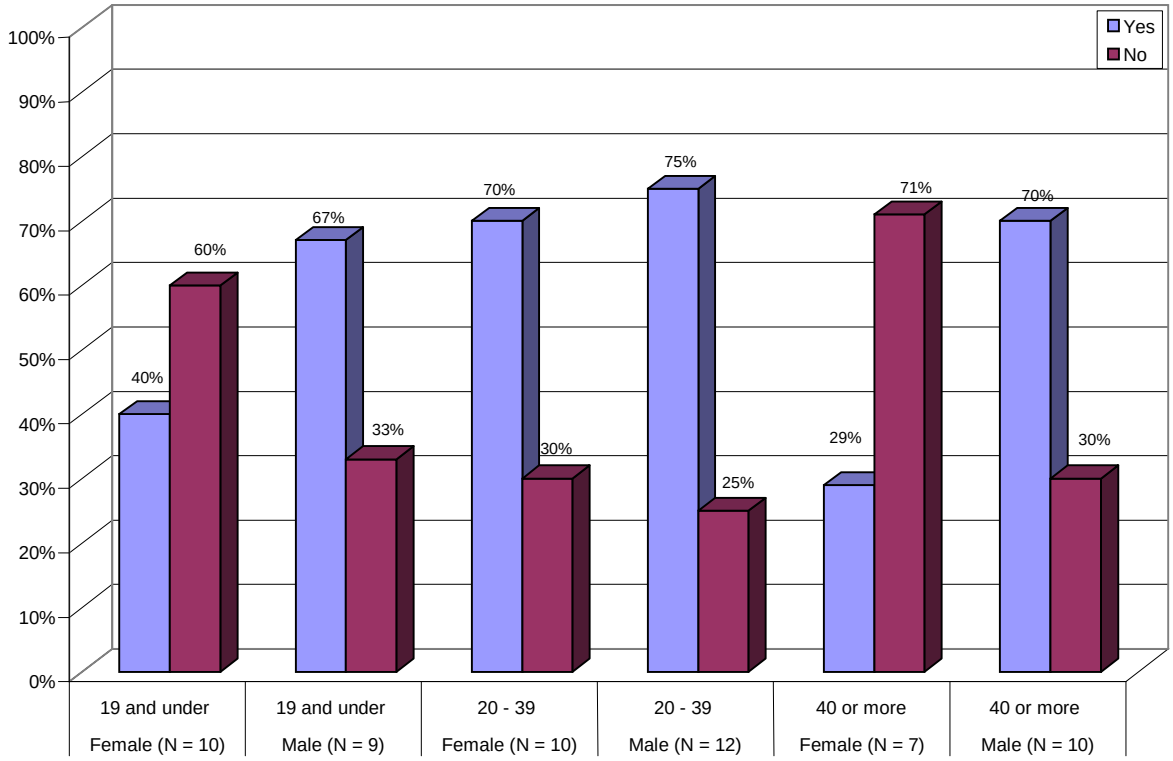


Table 38

Visitor Reactions to L.I.D.A.R., by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	10	
	Male	09	
Subtotal		19	(33)
20 – 39			
	Female	10	
	Male	12	
Subtotal		22	(38)
40 or More			
	Female	07	
	Male	10	
Subtotal		17	(29)
Total		58	(100)

L.I.D.A.R.
Figure 77. Do you live near the water?



L.I.D.A.R.
Figure 78. Did you find this exhibit easy to understand and operate?

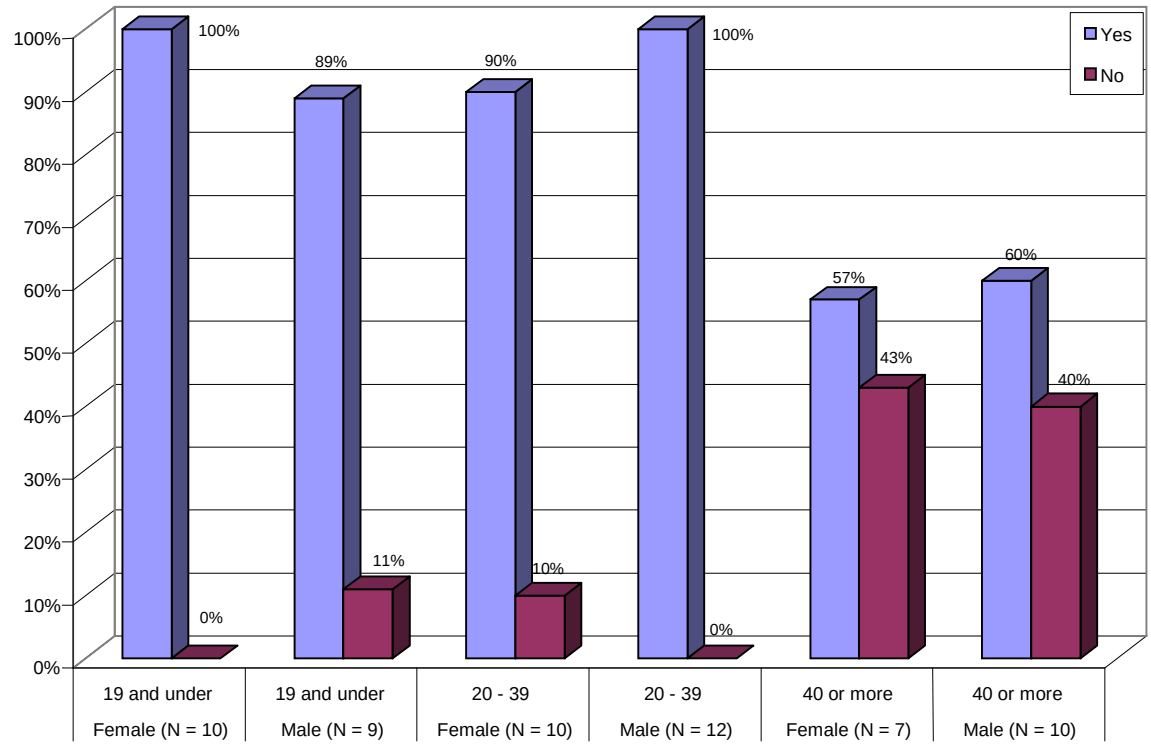
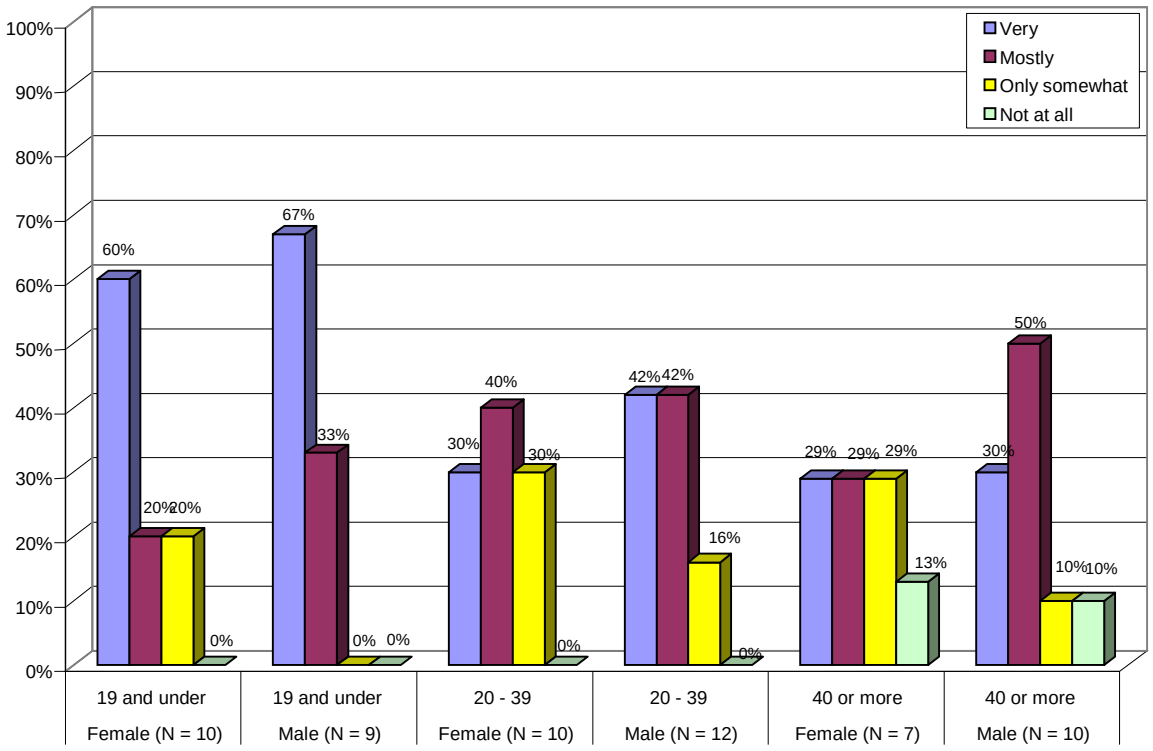


Table 39

If the exhibit was not easy to understand and operate, what was the problem?

Age	Gender	
19 and Under		
	Female	(no responses)
	Male	• Hard to control plane with joystick
20 – 39		
	Female	• I do not understand the colors on the video screen • I needed some assistance
	Male	(no responses)
40 or More		
	Female	• Joystick does not work as I think it should. Did not follow flooding patterns • Don't understand what the exhibit is doing; complicated to work
	Male	• No directions • Screen is too small to recognize certain areas • Hard to control movement of camera • The joystick does not seem to operate well • Joystick didn't work correctly • Not clear what the objective of the airplane piloting is

L.I.D.A.R.
Figure 79. Did you find this exhibit fun?



L.I.D.A.R.
Figure 80. Did you find this exhibit informative?

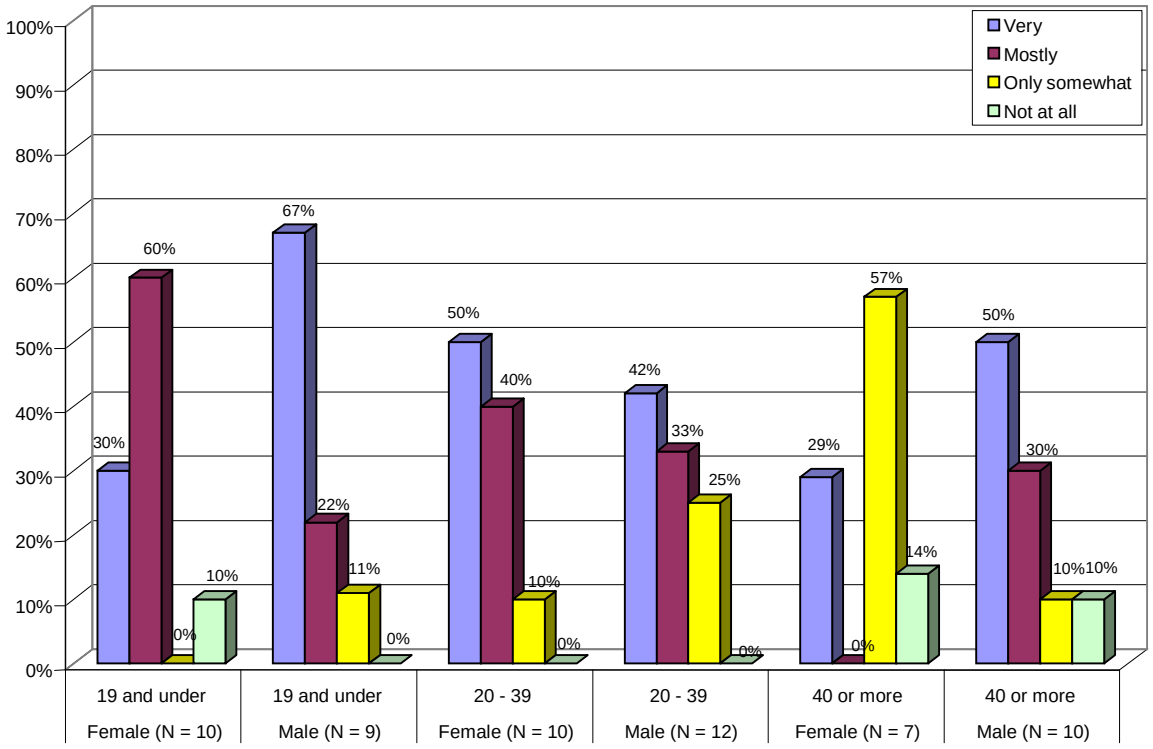


Table 40

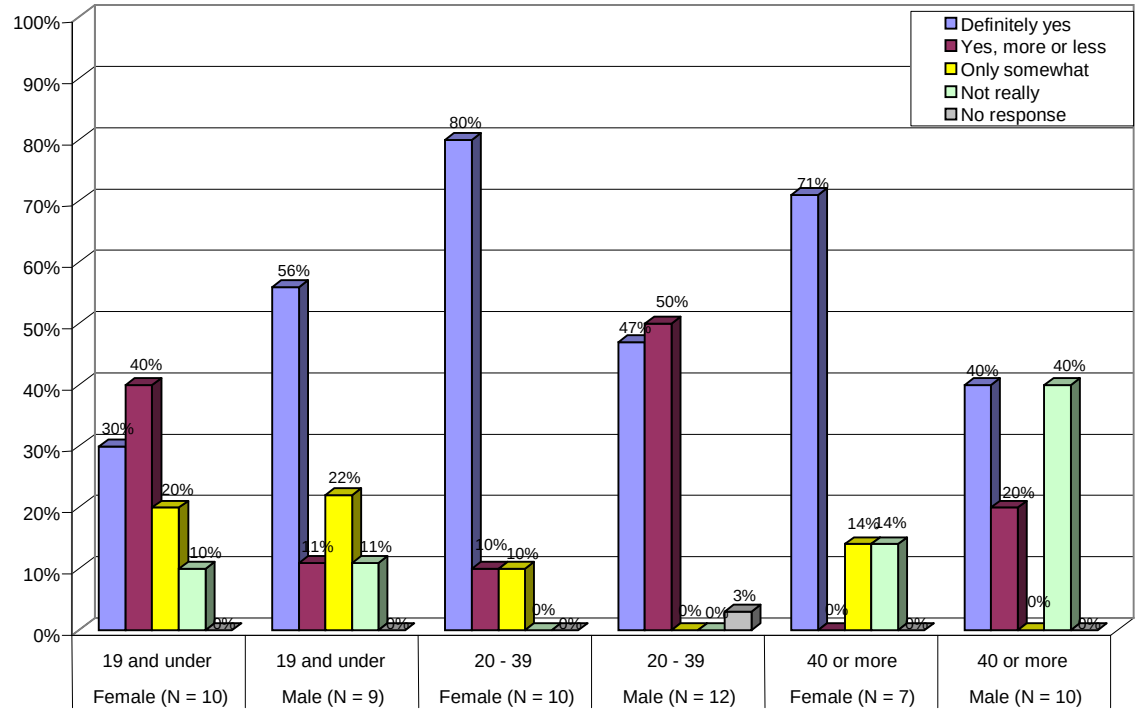
What message do you think this exhibit is trying to get across?

Age	Gender	
19 and under		
	Female	• Showing prominence of water in Tampa area • See how high water can go • How to fly over water • Lots of water in Tampa • Anyone can be caught in a flood • World is pretty – need to treat it better. • Some live in flood zones • Shows the dangers of storm surge
	Male	• It's about flooding • Shows what can happen with flooding • How to fly a plane • That water can vary during storms • How the city would look if water level was up • Live high • How storm affects the land
20 – 39		
	Female	• Flooding from hurricanes • The areas that would flood with storm surges • How low the terrain is here • How much storm surge can go up • Flooding • How intense weather is • Tells you about storm surge • Shows how Tampa does with storm surge • How much a city can be affected by rising water • Storm surges over land area.
	Male	• Giving an idea of areas most affected by storm surges • Storm surges and its effects • Being more aware of storm surge • Don't live near water • Different degrees of storm surge • Size of storm surge • It can be dangerous to live near the water • Flooding – warning • What areas can flood • Beware of storm surges • Storm surges cover land area • Shows how Tampa does with storm surge
40 or More		
	Female	• Get insurance! • Stay clear of the water • Don't' stay near the water • Something on flooding • Sea level comes up • Shows what happens during storm surge • Shows what part of area is affected if there is flooding

Male	
	• Showing evacuation routes in case of rising water • About flooding levels • Tell us about how unsafe we are from storm surge • Make people aware of storm surge in their area • Don't live near the water! • The areas that would flood with storm surge • What part of Tampa would be under water with a storm surge • Different water temperatures? • Storm surge • We are in danger from floods

L.I.D.A.R.

Figure 81. Does this exhibit increase your awareness of the problem of storm surge from hurricanes?



L.I.D.A.R.

Figure 82. Does this exhibit make you want to learn more about storm surge and its affects?

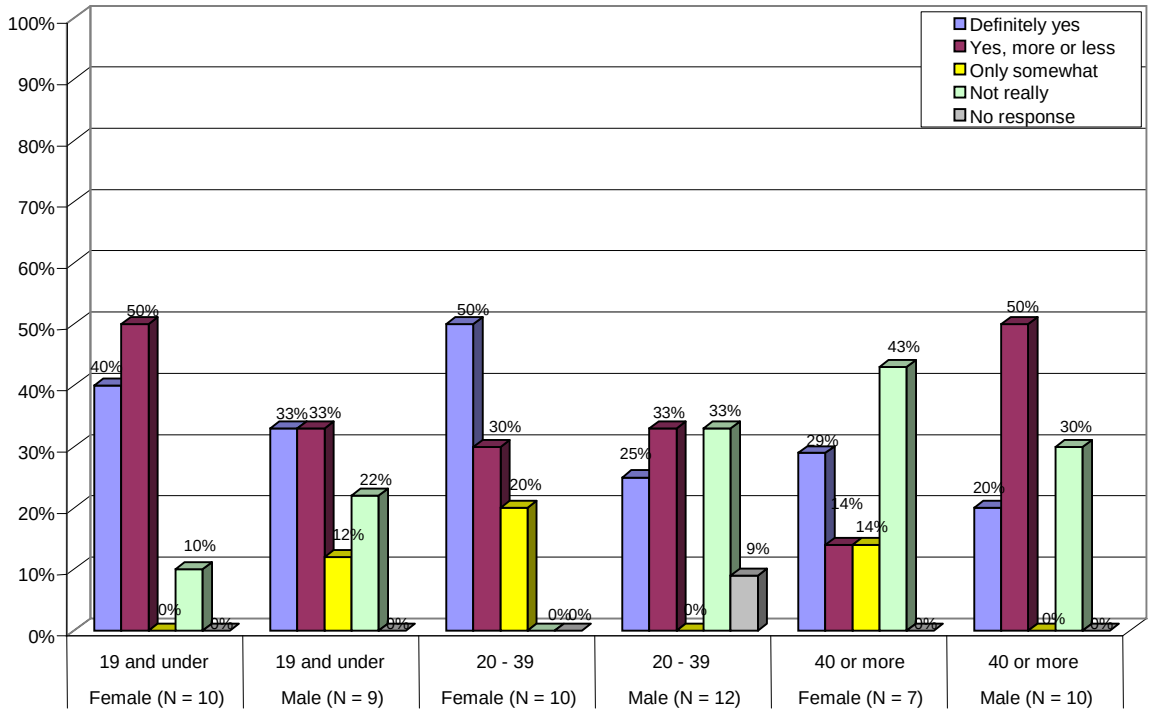


Table 41

What changes, if any, would make the L.I.D.A.R. exhibit more enjoyable or more informative?

Age	Gender	
19 and under		
	Female	• Joystick was difficult to control • Being able to move south on the map
	Male	• Like to be able to zoom in more closely on a particular spot • Have a larger airplane • Add Pinellas County to coverage
20 – 39		
	Female	• Add some kind of key to colors • More instructions about how to operate • Some information posted – can't hear because of lightning • More realistic • Wider screens so kids pay attention • Add names to spots on map. What kind of hurricane would cause each level of flooding • Needs to be more exciting
	Male	• I would like to be able to zoom in a little more • Have camera move vertically up and down in order to get a wider or narrower view • Enlarge map to include more of Tampa Bay • Add sound • Add names to spots on map
40 or More		
	Female	• Add written instructions • Make the joystick work better – hard to control movement • Make it more user friendly
	Male	• Add an explanation of what we are doing with this exhibit • Would like to see smaller detail on the screen • Joystick was difficult to control • Get the machine functioning properly

Visitor Reactions to *Disasterville*'s Dare to Touch Lightning Exhibit

Introduction

Visitors activating the Dare to Touch Lightning exhibit were observed and interviewed by the evaluators regarding their experience with the exhibit. An observation protocol was used to unobtrusively observe visitor interactions with the exhibit and the duration of those interactions, and an interview protocol was used to probe visitors' perceptions of their experience. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. A total of 75 visitors varying in age and gender were observed interacting with the exhibit, and a total of 58 visitors varying in age and gender were interviewed. The interviews were limited to those visitors who fully engaged the exhibit; those who only observed were not interviewed. The data were collected between November 18 and December 10, 2006.

The Dare to Touch Lightning exhibit is one among a number of exhibits and kiosks concerning the causes, effects or mitigation of natural hazards. It provides visitors the opportunity to "touch" a bolt of electricity without experiencing shock. The exhibit is comprised of a central electrical coil surrounded by a square metal frame about 40 inches on a side. Two of its four sides contain an opening fitted with a chain mail metal glove into which visitors may insert their arm. Once the arm is fully inserted, the visitor may press and hold a button to create a bolt of electricity which jumps from the central coil to the tip of the metal glove. The release of the electrical charge is accompanied by a loud noise. The exhibit can accommodate two visitors at a time.

Summary of Results

Observations

Based on the unobtrusive observations, the duration of visitor engagement with the Dare to Touch Lightning exhibit was typically relatively brief, seldom lasting more than 30 seconds. Females in the 40 or more age category appeared to spend the least amount of time with the exhibit (Figure 83). Most visitors being observed engaged the exhibit fully (placed their hand in the metal glove and activated the electric current), but a few visitors, particularly among the young, were unwilling to place their hand in the glove (Figure 84). The evaluators observed that the noise made by the electrical charge being released within the exhibit frequently startled visitors of each gender. The evaluators also observed that some visitors had trouble trying to determine how to activate the exhibit.

Interviews

The majority of visitors who were interviewed admitted having experienced a frighteningly close lightning strike at some point in their life; this was particularly true for females in the 20-39 and 40 or more age categories (Figure 85). A number of interviewees reported having difficultly figuring out how to work the Dare to Touch Lightning exhibit; females generally reported being confused by the exhibit more frequently than males (Figure 86). As compared to others, interviewees in the 19 and under age category--particularly young females--were more likely to express nervousness about placing and keeping their hand in the metal glove (Figures 87 and 88). Female interviewees in the 40 or more age category were also likely to express nervousness about having their hand in the metal glove (Figure 88). Most interviewees reported finding the exhibit both “exciting” and “stimulating”; this was particularly true of young males (Figures 89 and 90). Interviewees in the 40 or more age grouping were somewhat less likely than others to characterize the exhibit as “exciting” or “stimulating”.

Learning and Perceptions

When asked, "Was there anything about the experience that you didn't expect?" many of the interviewees expressed surprise that they didn't feel an electric shock. Some were surprised by the loud noise generated by the exhibit (Table 44). When asked, "Does this experience make you want to learn more about lightning and how it works?" most interviewees responded "Definitely yes" or "Yes, more or less". The least positive responses to this question came from those interviewees who were 40 or more (Figure 91).

Based on the numbers of visitors who stopped to engage or observe Dare to Touch Lightning, this exhibit appears to be among the most popular on the floor.

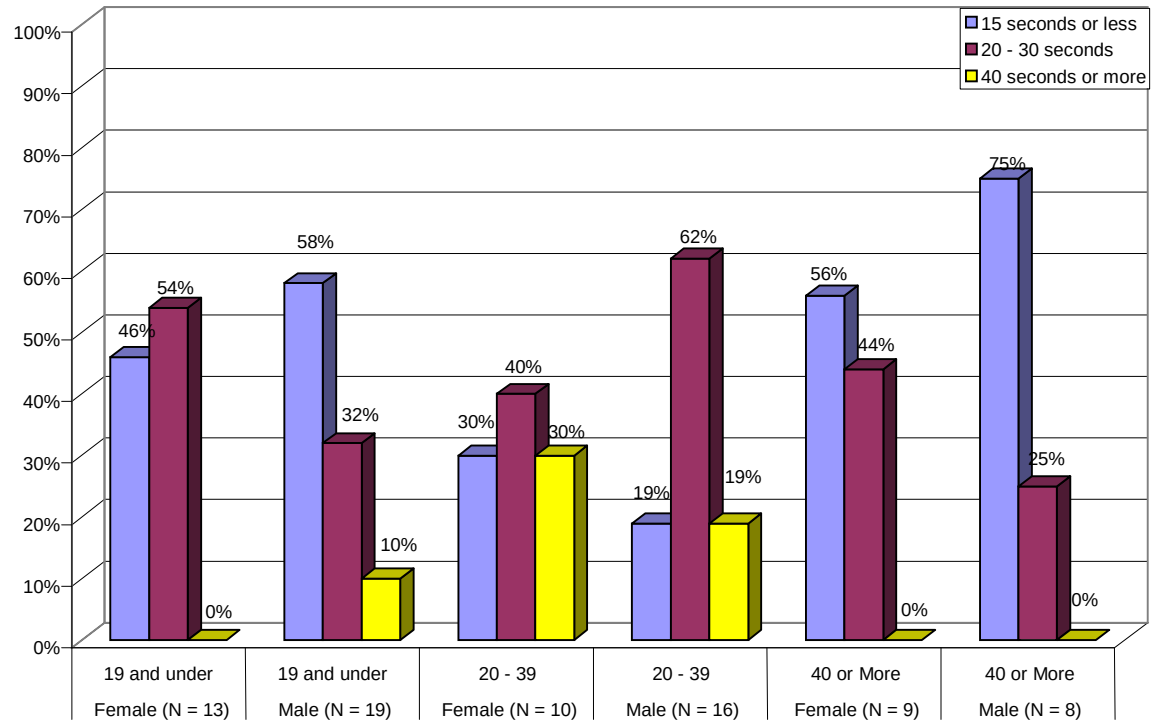
Dare to Touch Lightning Tables and Figures

Table 42

Number of Observations for Dare to Touch Lightning, by Gender and Approximate Age

Age	Gender	No.	%
19 and Under			
	Female	13	
	Male	19	
Subtotal		32	(42)
20 – 39			
	Female	10	
	Male	16	
Subtotal		26	(35)
40 or More			
	Female	09	
	Male	08	
Subtotal		17	(23)
Total		75	(100)

Dare to Touch Lightning
Figure 83. Duration of Engagement by Gender and Approximate Age



Dare to Touch Lightning
Figure 84. Visitor Action by Gender and Approximate Age

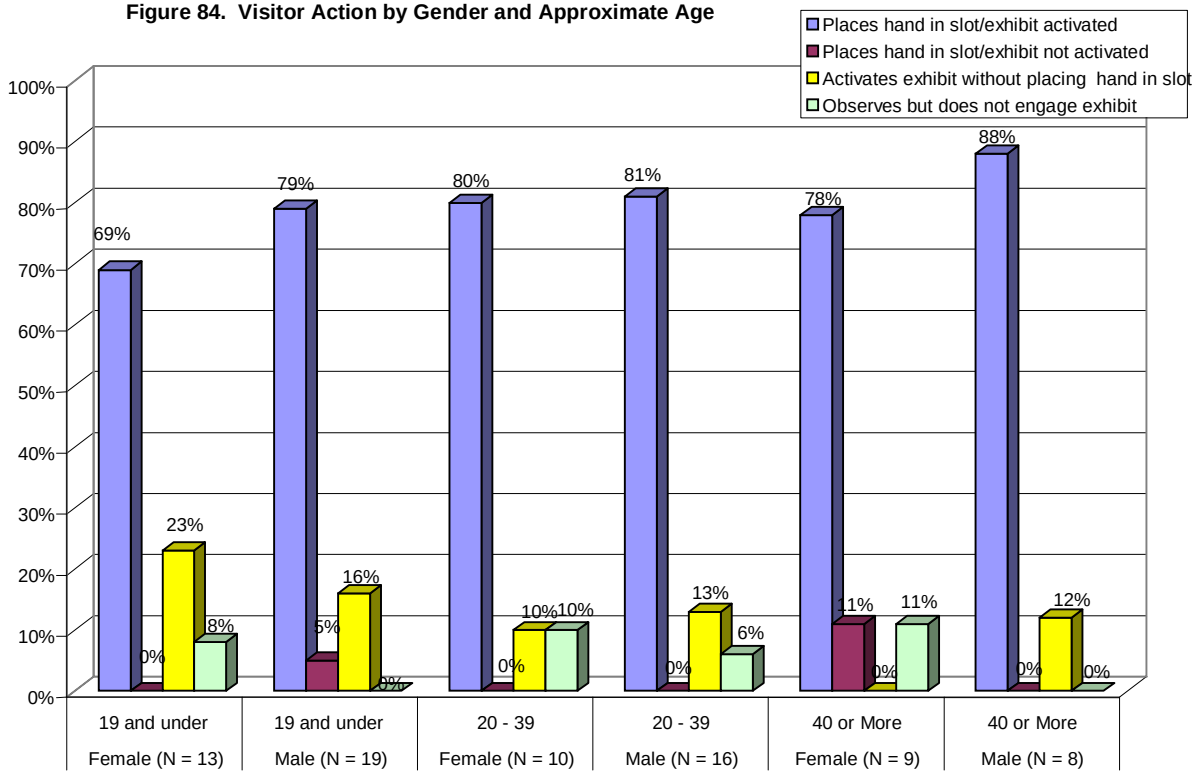
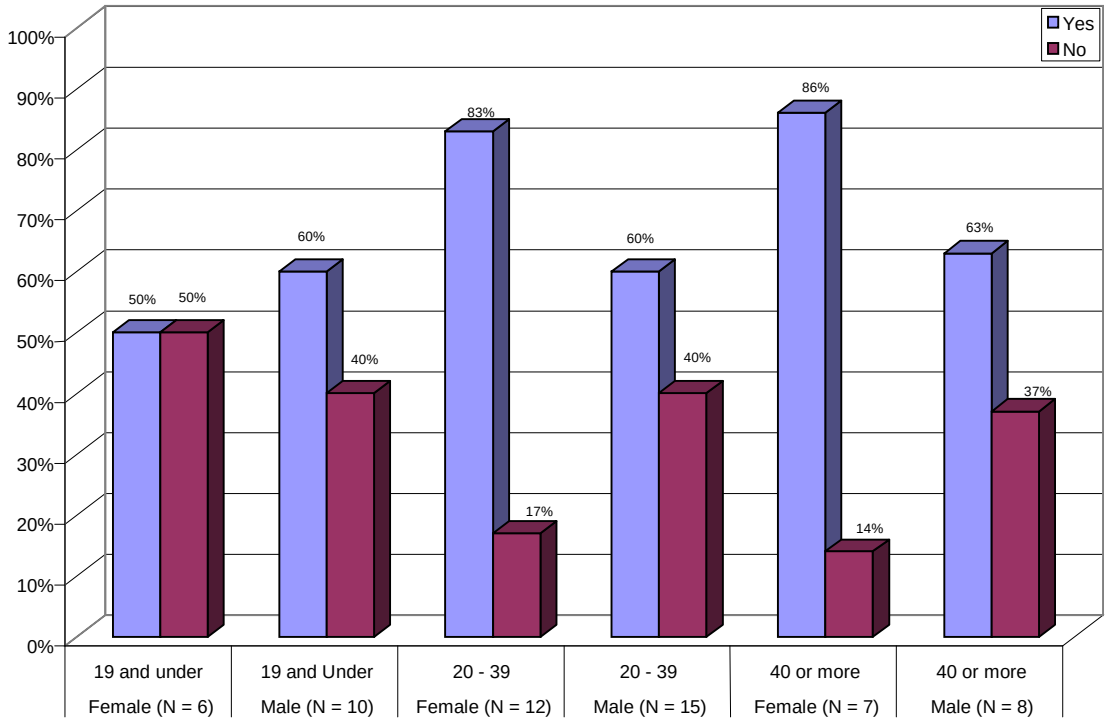


Table 43

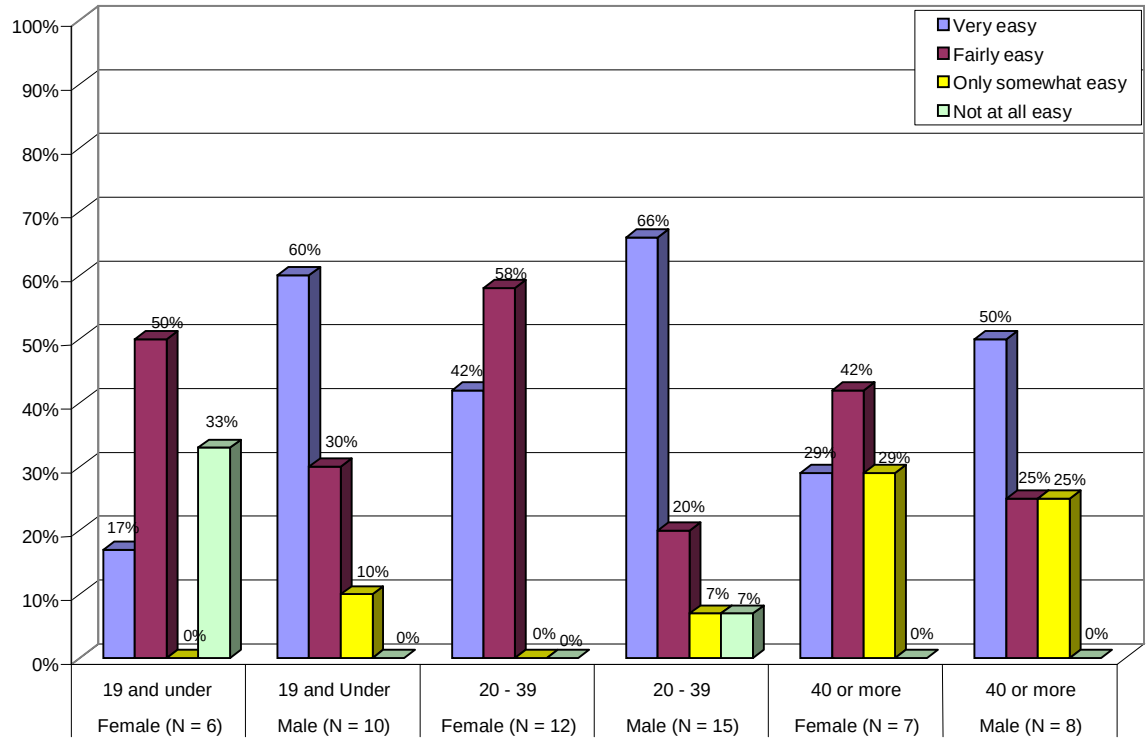
Visitor Reactions to Dare to Touch Lightning, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	06	
	Male	10	
Subtotal		16	(25)
20 – 39			
	Female	12	
	Male	15	
Subtotal		27	(50)
40 or More			
	Female	07	
	Male	08	
Subtotal		15	(25)
Total		58	(100)

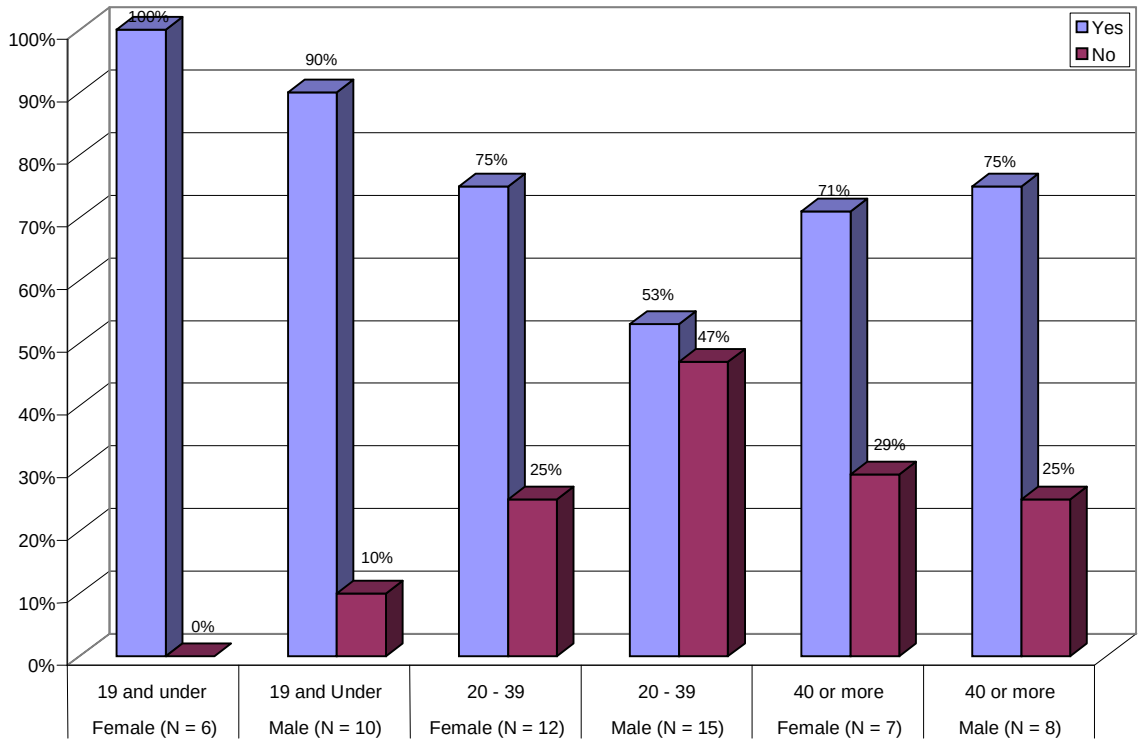
Dare to Touch Lightning
Figure 85. Have you ever been frightened by a close bolt of lightning?



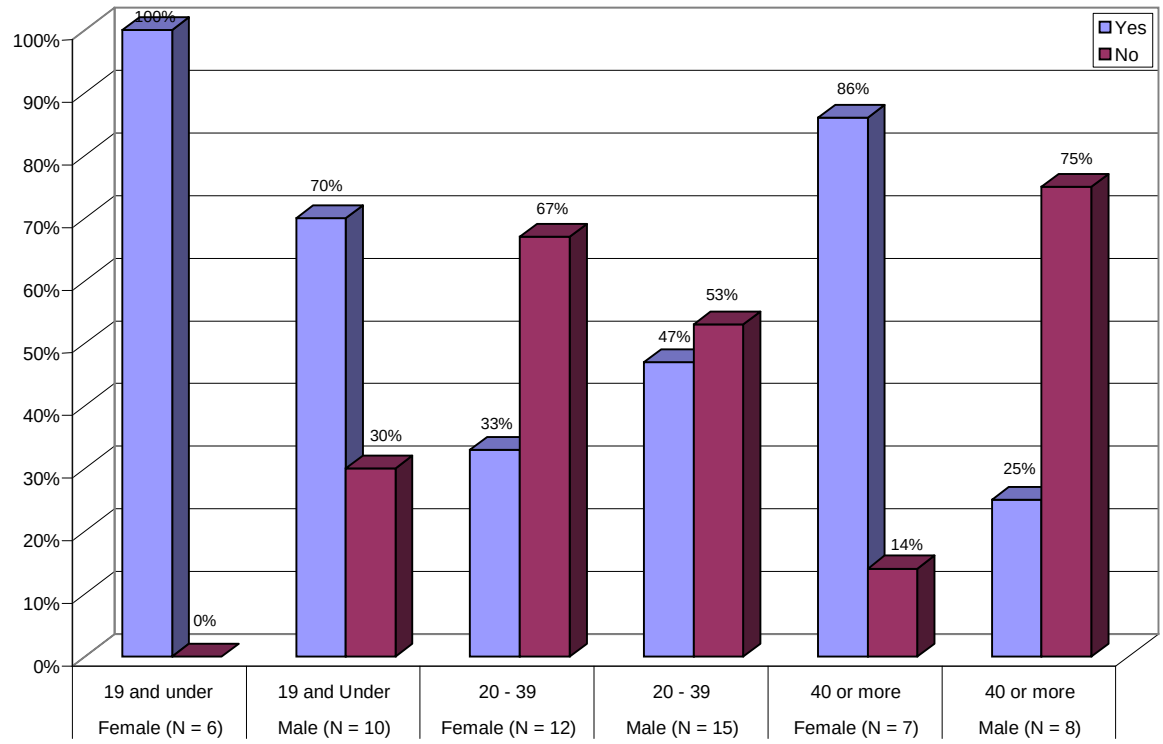
Dare to Touch Lightning
Figure 86. How easy was it to figure out what to do with this exhibit?



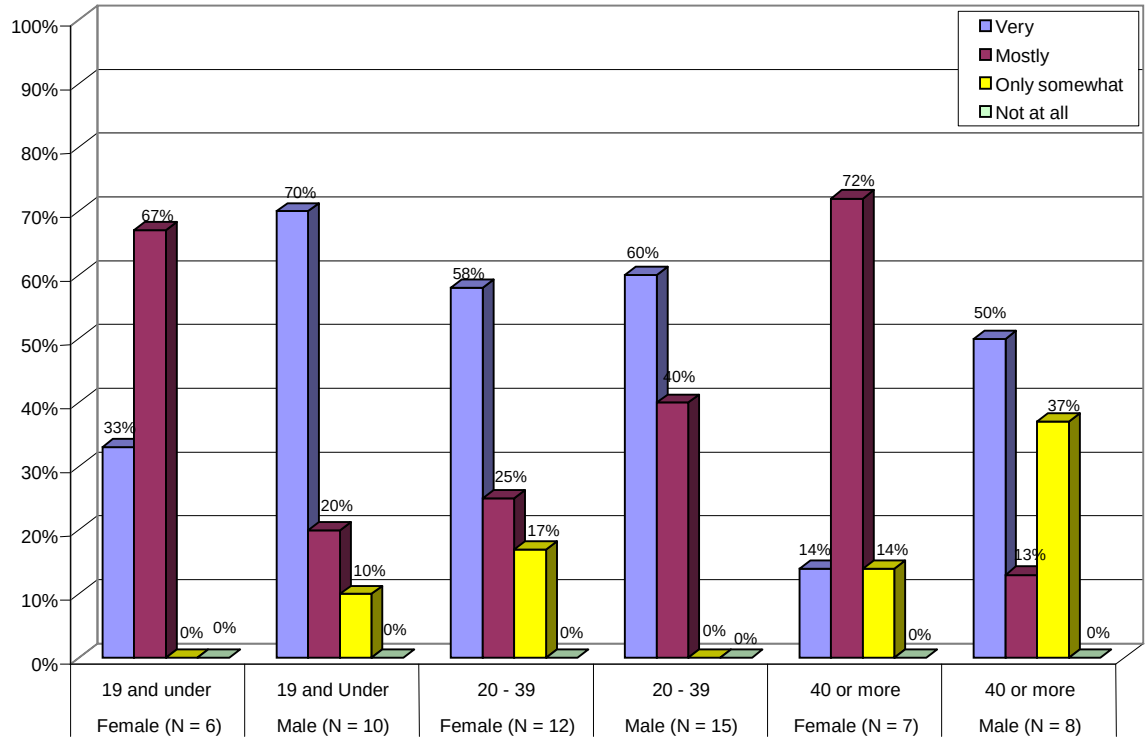
Dare to Touch Lightning
Figure 87. Were you a little nervous about putting your hand in the slot?



Dare to Touch Lightning
Figure 88. Were you a little nervous while your hand was inside?



Dare to Touch Lightning
Figure 89. Did you find the experience exciting?



Dare to Touch Lightning
Figure 90. Did you find the experience stimulating?

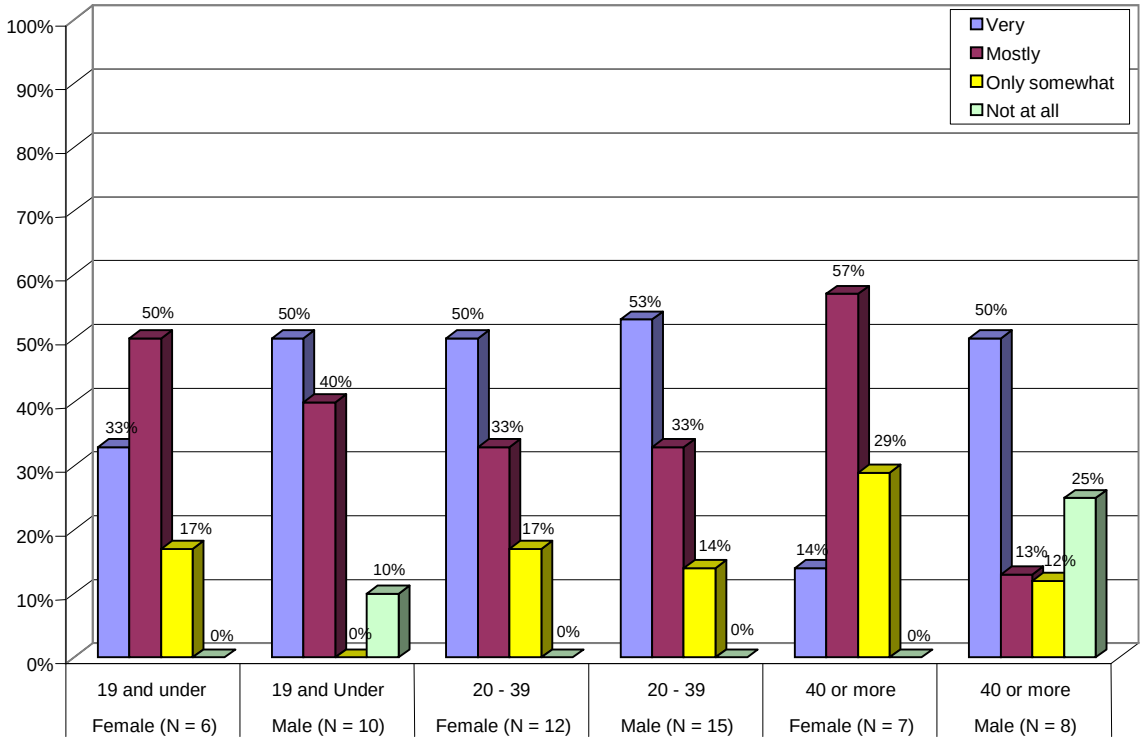


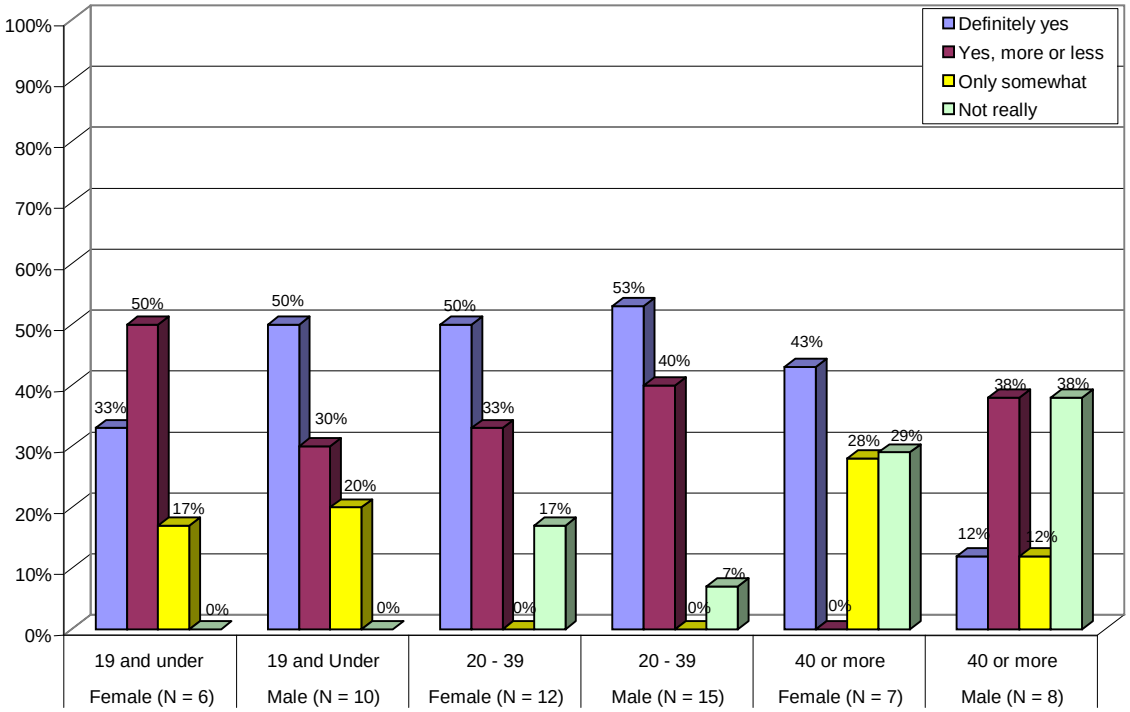
Table 44

Was there anything about the experience that you didn't expect?

Age	Gender	
19 and Under		
	Female	• No shock • Thought there would be shock • Didn't know it was so loud • No shock • Thought I'd get shocked • Thought it would shock
	Male	• No shock • No shock. • No shock • No shock • No shock • Thought it would shock • No shock • Didn't expect it to shoot into hand • Lightning
20 – 39		
	Female	• The loudness of it • Noise • Noise • No shock • Didn't expect lightning to touch glove • Thought there would be a little tingle • Thought it would shock • Loud sound
	Male	• No shock • Loud sound • Thought it would shock • Thought there would be a shock • Expected a sensation
40 or More		
	Female	• No shock • No shock • The noise • No shock • No shock
	Male	• The noise • Smell of ozone • No shock. • More scary to others

Dare to Touch Lightning

Figure 91. Does this experience make you want to learn more about lightning and how it works?



Visitor Reactions to *Disasterville's* Fortification Kiosks

Introduction

MOSI's *Disasterville* contains eight fortification kiosks that provide visitors with information on protecting their home and surroundings against the following natural hazards: Earthquake, flood, hail, hurricane, lightning, tornado, volcano, and wildfire. Each kiosk contains "House Helper" information on one of the eight natural hazards. The kiosks are placed on the floor near the exhibits that concern the natural hazards the kiosks represent. The evaluators used an observation protocol to unobtrusively observe visitor engagement with each of the eight fortification kiosks and the duration of that engagement. Visitors to each fortification kiosk were asked whether or not the display appealed to them and the reason for their response. For those visitors who engaged a fortification kiosk for 20 seconds or more, an interview protocol was used to further probe visitors' perceptions of their experience. The typical interview was completed in less than a minute. A total of 152 visitors varying in age and gender were asked to rate the fortification kiosk they had experienced in terms of its appeal (Table 46), and a total of 86 visitors were interviewed (Table 48).

Data from all eight of the fortification kiosks are included in the observations and ratings summarized below. Data from all eight kiosks are also included in the interview results, with the exception of the results in Figure 101. That figure contains the summary of responses to the last interview question, "Based on what you saw in the display, do you intend to reexamine your own home and surroundings in terms of reducing the risk from this natural hazard?" A somewhat different question was posed to interviewees who had examined the earthquake and volcano displays. Therefore, the results contained in Figure 101 do not include responses for those two displays. All the data summarized below were collected between December 22 and December 30, 2006.

The fortification kiosks use a touch screen approach to present several information screens to the viewer, including information on what to do if the natural hazard occurs, what adults can do, how kids can help, and tips on fortifying your house. Each kiosk can comfortably accommodate two visitors at a time.

Summary of Results

Observations

Based on unobtrusive observations, the duration of visitor engagement with the fortification kiosks varied from a few seconds to over a minute. Those in the 19 and under age category tended to spend a comparatively short amount of time with the displays, typically 20 seconds or less. Those in the 20 to 39 category tended to spend the most time with the displays, often 60 seconds or more (Figure 92). Patterns in the visitors' duration of engagement carried over to the visitors' actions while at the display. Both the younger and older adults were much more likely to engage all or most of the display screens, as compared to those 19 and under. The phenomenon of jumping quickly from screen to screen, with little effort to read, was confined largely to those who were 19 and under (Figure 93).

Ratings

When presented with a three-point scale asking whether the fortification display they had experienced appealed to them (yes, somewhat, no), visitors of all ages and both genders gave generally affirmative responses. Even so, the response patterns were distinguishable across age groupings, being more strongly positive among adults 20 to 39 and 40 or more, and somewhat less positive among those 19 and under. Of all age by gender groupings, the older males clearly found the displays the most appealing (Figure 94). Those visitors who indicated that the fortification display appealed to them most often cited as their reason the usefulness of its information. Some liked the ease with which they could negotiate the display; others mentioned

the touch screen technology, or some particular fact or suggestion they came across (Table 38). The minority who found their display unappealing typically characterized the display as boring or lacking in interactivity. A few stated that it was unappealing either because they already knew the information; or in the case of earthquakes or volcanoes, they considered the information irrelevant, being from Florida. Most of those who considered the fortification display to be "boring" were in the 19 and under age grouping (Table 47).

Interviews

The great majority of visitors who were interviewed regarding their experience with a fortification display characterized the display as easy to use, and the graphics as easy to read and understand. This response pattern was fairly consistent across all age by gender groupings (Figures 95 and 96). The majority of interviewees also indicated that the information in the display was both interesting and useful. In each case, the most positive responses tended to come from females 19 and under, and males 20 to 39 (Figures 97 and 98). Asked whether it was useful having a section on how kids can help, a majority of interviewees across all age by gender groupings answered in the affirmative; females, regardless of age, were more affirmative on this question than males (Figure 99).

Learning and Perceptions

When asked, "Did you see anything in the display that you might want to learn more about on your own?" the inteviewees gave responses that varied by age and gender. The most common response among females and males 20 to 39, as well as males 40 or more was "yes". The most common response among males 19 and under and females 40 or more was "no". The most common response among females 19 and under was "not sure"(Figure 100). Those interviewees who indicated that they saw something they would like to learn more about were asked specifically what that might be. They offered a variety of responses, but many identified

information contained in the My Fortified House segment of the displays (Table 49). All interviewees except those for Volcano and Earthquake were asked whether they intended to reexamine their own home and surroundings in terms of reducing risks from the natural hazard portrayed in the display. The interviewees gave quite divergent responses. Males 20 to 39 were strongly affirmative on the question. Females 19 and under and 20 to 39, and males 40 or more showed a preference for "probably". Females 40 or more were noticeably split in their responses—for the most part they answered either "definitely yes" or "no, not really". Males 19 and under were the least positive of all the age by gender groupings, with most indicating "not sure" or "no, not really" in response to the question (Figure 101).

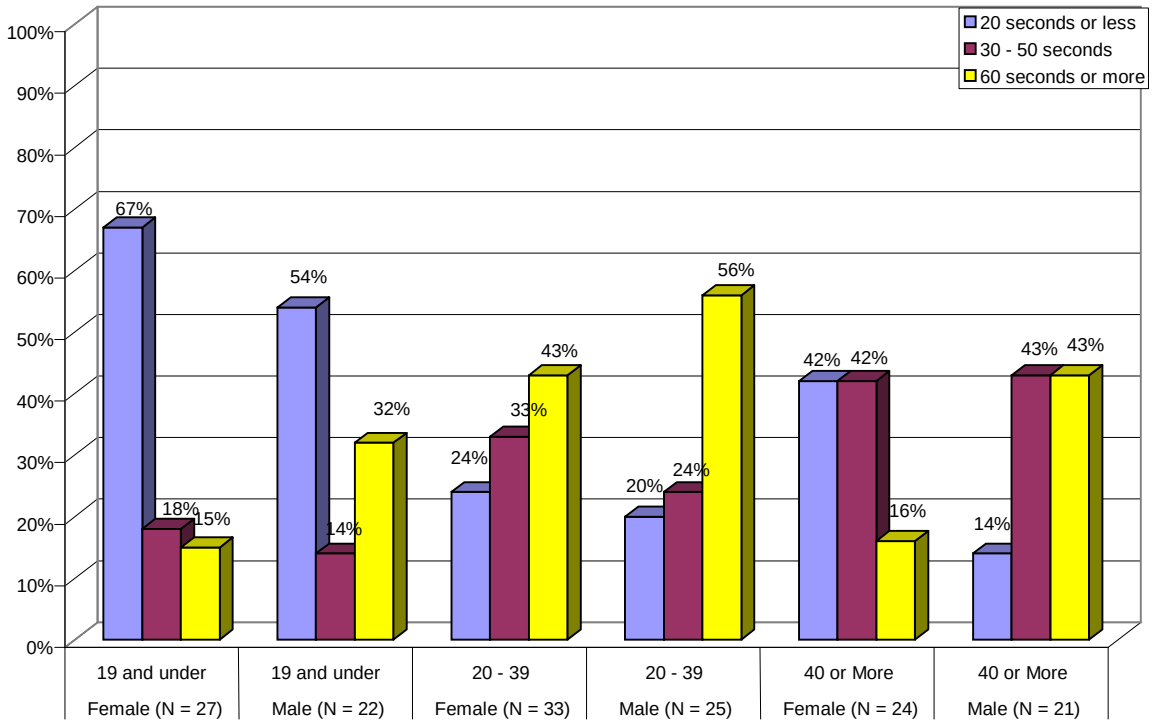
Fortification Tables and Figures

Table 45

Number of Observations on Fortification Kiosks, by Gender and Approximate Age

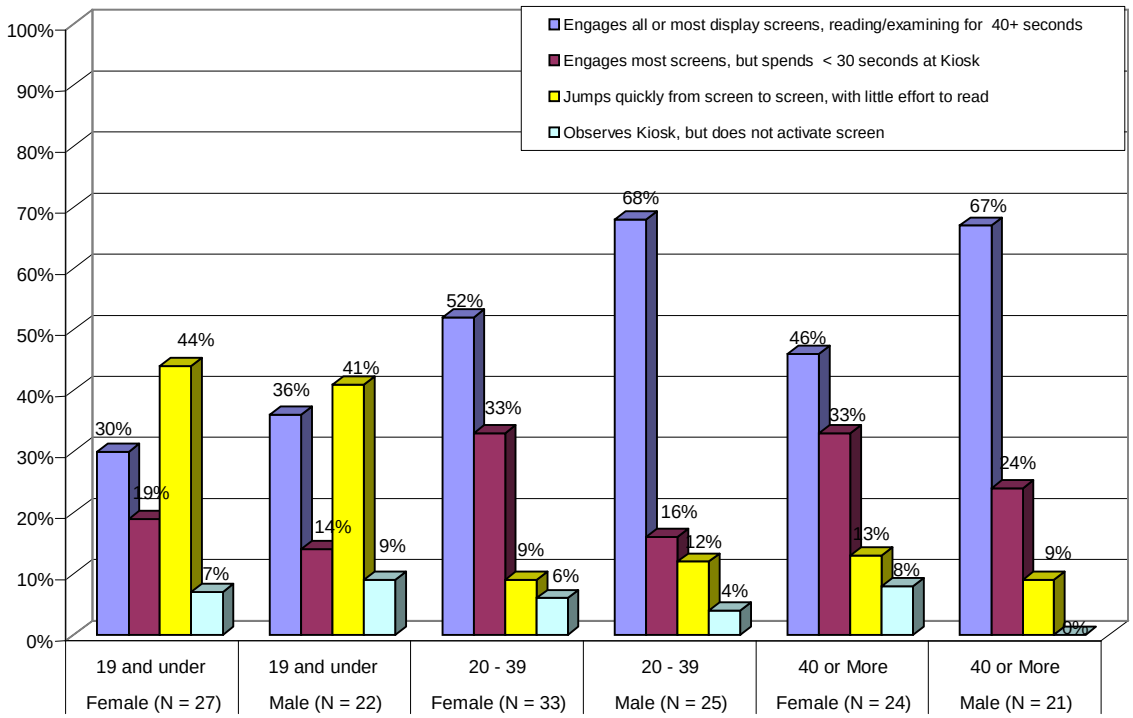
Approximate Age	Gender	No.	%
19 and Under			
	Females	27	
	Males	22	
Subtotal		49	(32)
20 – 39			
	Females	33	
	Males	25	
Subtotal		58	(38)
40 or More			
	Females	24	
	Males	21	
Subtotal		45	(30)
Total		152	(100)

Figure 92. Duration of Engagement for Fortification Kiosk by Gender and Approximate Age



Forification Kiosk

Figure 93. Visitor Action by Gender and Approximate Age



Fortification Kiosk Visitor Ratings
Figure 94. Did this exhibit appeal to you?
(by Gender and Approximate Age)

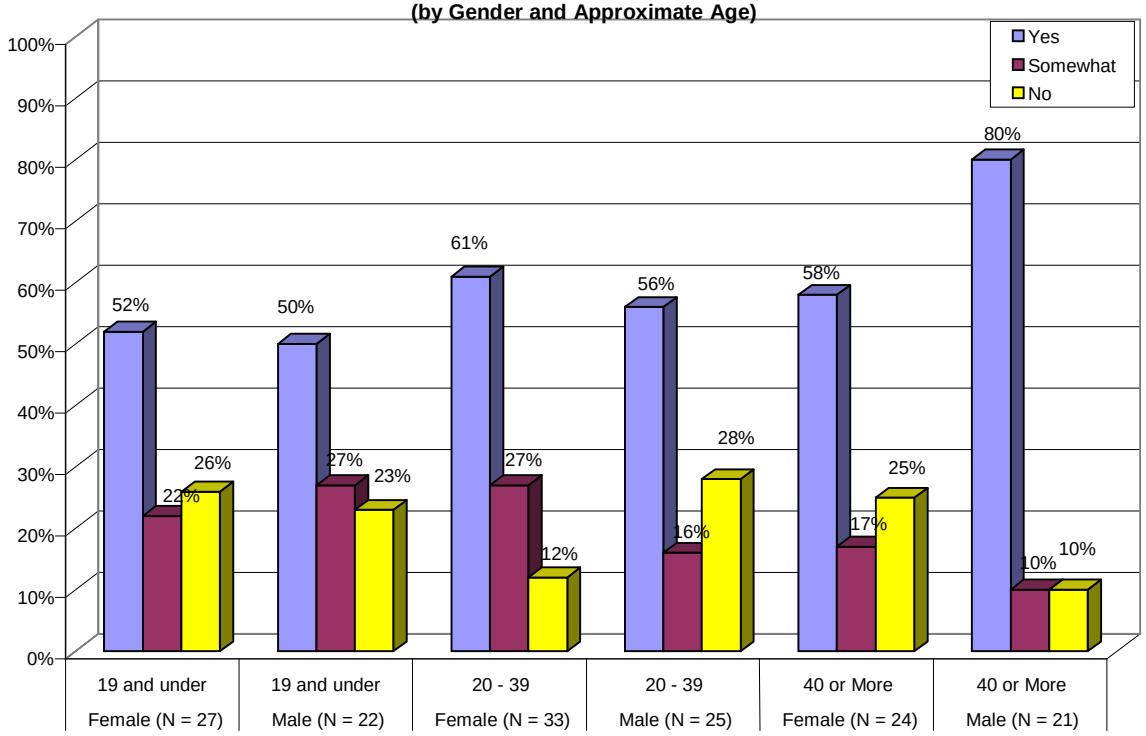


Table 46

If the Fortification Kiosk Appealed to You, What was Most Appealing?

Age	Gender	
19 and Under		
	Female	• It's easy to read and the information is to the point • I like the touch screens and I like the information about what you should do. • Good Information • Interesting information • Interesting • It teaches you things about tornadoes • Helps you learn useful stuff • I liked information about adding lightning detectors; touch screens. • It tells me about what to do in floods. • It shows the way to protect your house. • I like the information • Hard questions • Simple and easy to use and has some useful information. • I like the touch screen.
	Male	• Good information about tornadoes • I like the touch screen, and the information was ok • It's got good information, its colorful, easy to use. • I like the section on what kids can do. • It's easy to work.
20 - 39		
	Female	• It was informative. • Learned a few things. • Learned some things. Very easy to use. • Important for growing areas. • I like the touch screen concept and the information was easy to comprehend. • The colors are bright and attractive and the sentences are short. • Gave good information about what to do in case of an eruption. • It was informative. • I learned a few things. • Easy to use. • I think it's a good little exhibit. Kids need to know what to do. • It was interesting. • Time spent at exhibit depends on the child. *Disasterville* is really a great areas though. • We learned about how to fortify the house I live in – a wildfire prone area in California. • We need more information like this in Florida. • I like the section on how kids can help, how to protect yourself. • I like the ease and simplicity of it. • Easy to sue, but some of the information was too limited. • I like the ease of use and the information (some of the other kiosks jumped around too much). • I like that it was hands-on and easy to use. • Interesting questions.

Table 46 (continued)		**Fortification**
	Male	• It definitely informed me that I should go inside sooner than I would have previously. • Straight forward; good information; but you need to jazz it up with motion pictures (e.g., show a bolt of lightning hitting a house). • It's ok for adults but you need it to be more exciting for kids, more interaction, more movement. • Good information • It had information on something that bothers me. • Easy and straightforward and the information was useful. • Touch screen is nice concept, but it jumps too quickly from screen to screen when you're trying to read. • Because of previous experience with hail in Kansas. • Useful information. • Useful material on impact siding. • Public needs hurricane awareness. • Good information. • Good information for people to have.
40 or More		
	Female	• It had useful information and was quick. • It's cool. • Good information. • I like the way you can navigate from screen to screen. • The graphics need improvement – maybe animate the kids' activities. • It's cool – turn the exhibit around so its not in the light – hard to read the screen. • Learn some useful things, like more expensive siding. • Easy to read and understand; graphics were clear. • It's interesting. • Interesting • The big flame on the background attracted me. • Easy to understand. • Good information on how to fortify your house, like the spark arrester. • The information is good, but need to slow it down, it jumps from one screen to another by itself before I can read it. • It is one of the most frightening natural occurrences. • Always useful in Florida.
	Male	• It is important to know this material in Florida. • Very informative. • Gave me ideas about how to protect appliances. • Easy to handle, but some of the display screen cut off too quickly before I've finished reading them. • I liked the fortified house. • It's good for the kids. • Easy to understand. • Shows you how you have to secure your property. It's ok, not fantastic. Got good basic information. Add a notepad so people could write information down and take it with them. • Learn some things about roof sprinklers systems and chimney spark system. • It's basic, useful information. • Good information on improving our chances of surviving. • It's very easy to figure out.

Table 47

If the Fortification Kiosk did not appeal to you, why not?

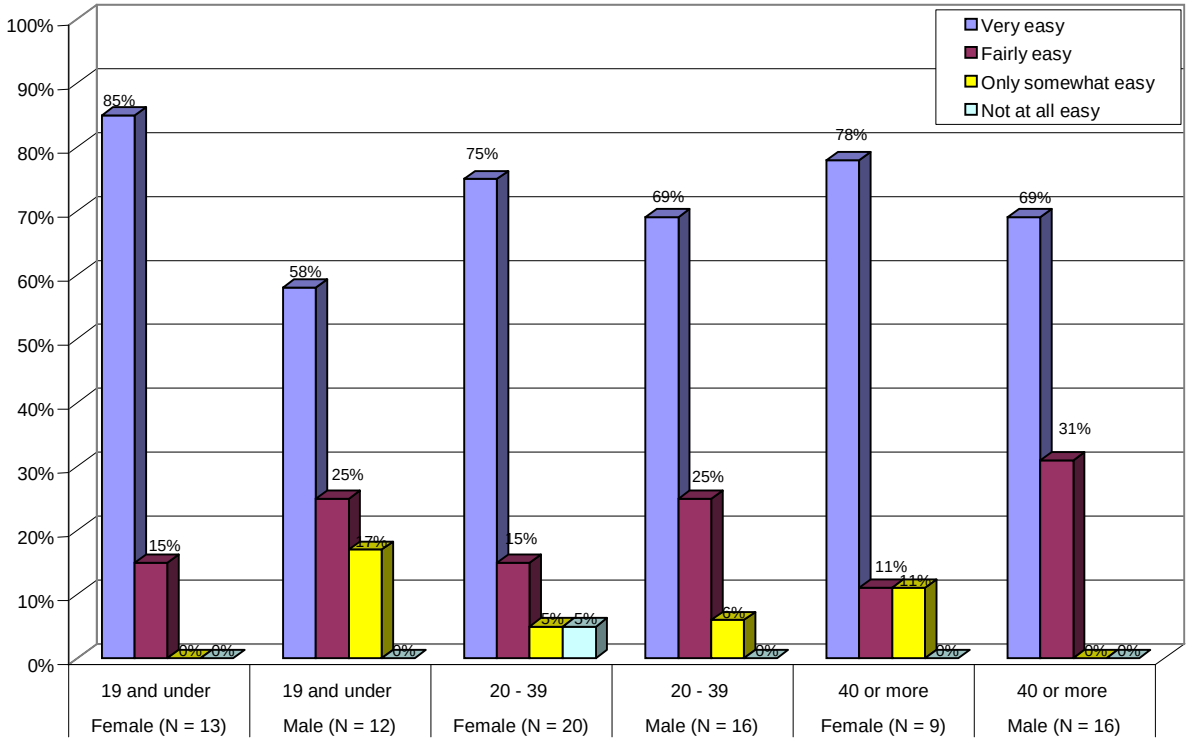
Age	Gender	
19 and Under		
	Female	• It's boring. • Kind of boring – just information. • Too simple. • Too much to read. • It's boring. • Not fun. • It's boring.
	Male	• I don't really get it. • A bit boring. • Only reading stuff. • No interactivity. • Too much information on how to build a house; not very interesting. • Not really interested in tornadoes. • The information isn't all that relevant to us because we don't live in an earthquake zone, but graphics are nice.
20 - 39		
	Female	• Problem with screen. • The screen changes too quickly. • Wouldn't be very exciting for my kids. • Screen jumps around a lot; it's rather one dimensional; too much information on some screens. • No interaction.
	Male	• The information was a bit dull. • I would like to see more interaction; more motion – video maybe of lightning striking the house. • Not much to it. • Nothing to do. • Not much to it. • As a Floridian, not much concern about earthquakes. • Interactive element is good; but it is a bit simple in its information. • Too slow, most screens were not touch active
40 or More		
	Female	• Nothing really is happening with this exhibit – just information. • As adults, we already know all that stuff. • It does not do much – just questions. • Not very exciting.
	Male	• I am familiar with this information. • It's no big deal – in this day and age the graphics should be animated, not static. • Too boring – not active enough. Make a game out of it.

Table 48

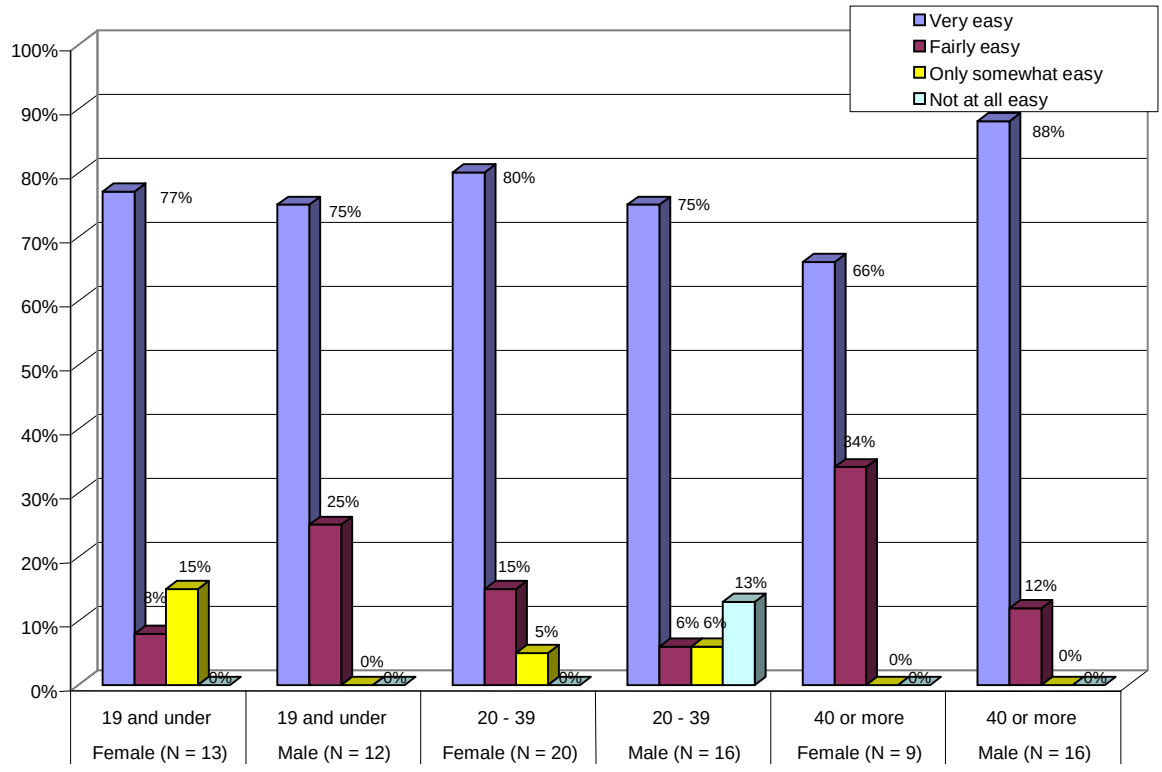
Visitor Reactions to Fortification Kiosks, by Gender and Age

Age	Gender	No.	%
19 and Under			
	Female	13	
	Male	12	
Subtotal		25	(29)
20 – 39			
	Female	20	
	Male	16	
Subtotal		36	(42)
40 or More			
	Female	09	
	Male	16	
Subtotal		25	(29)
Total		86	(100)

Fortification Kiosk
Figure 95. Did you find this display easy to use?

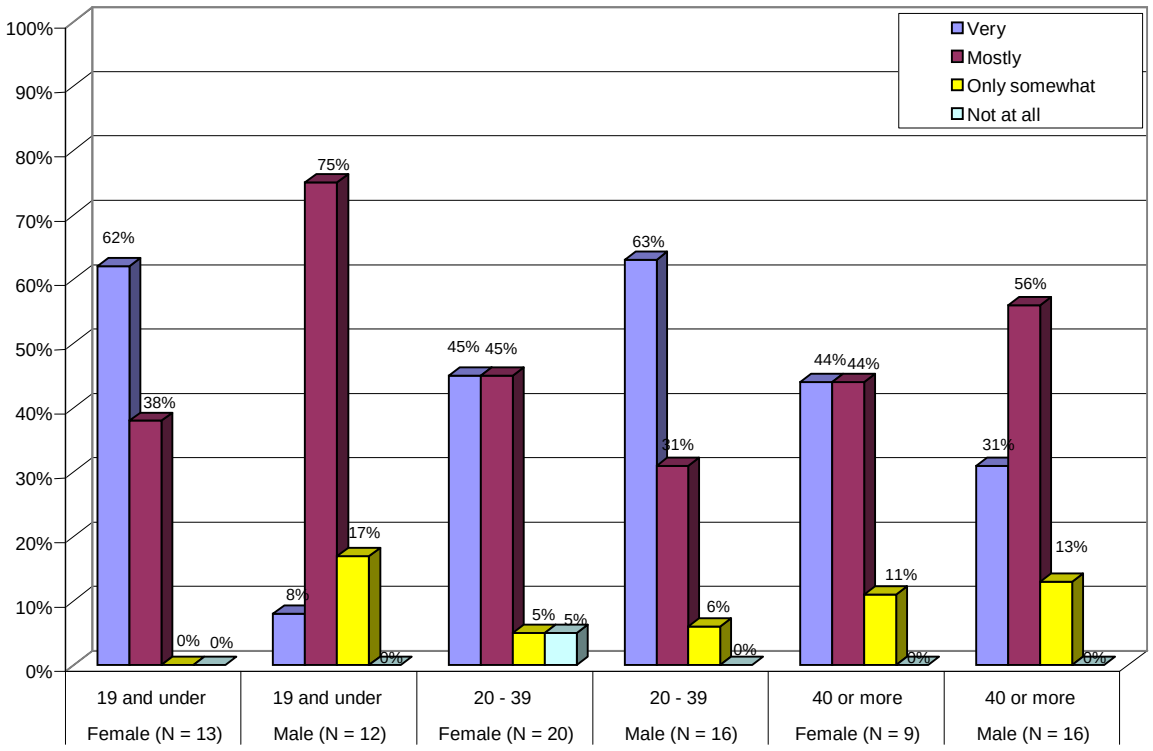


Fortification Kiosk
Figure 96. Were the graphics easy to read and understand?



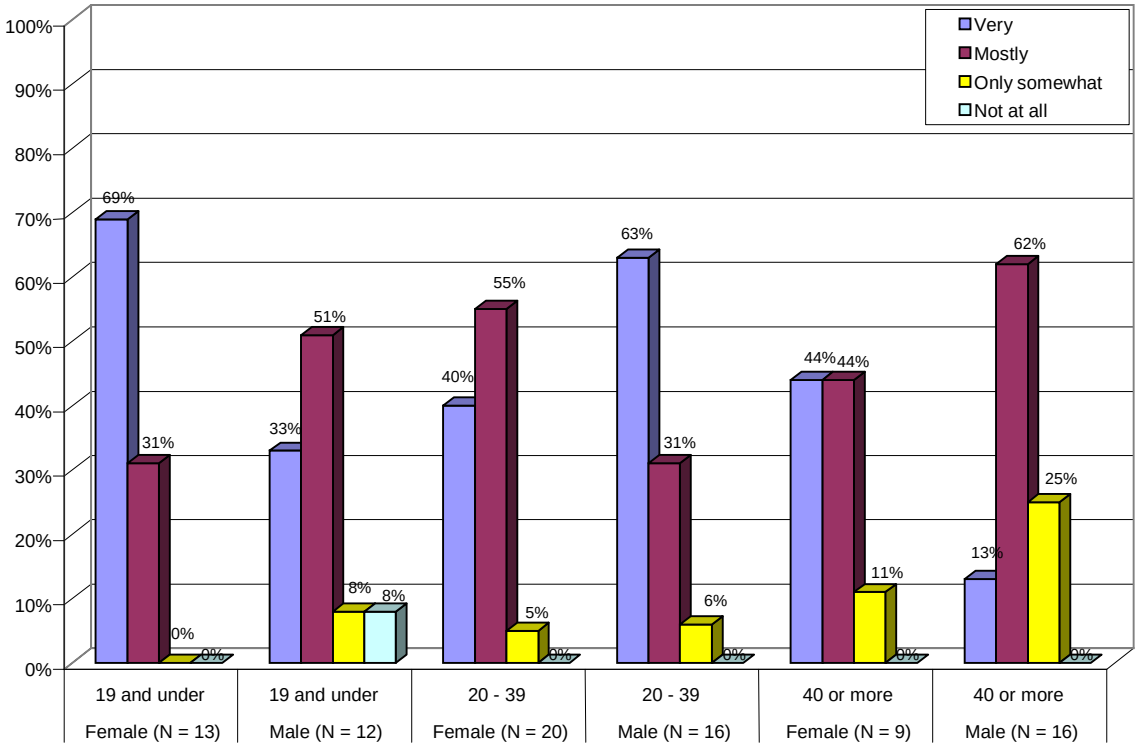
Fortification Kiosk

Figure 97. Did you find the information in the display interesting?

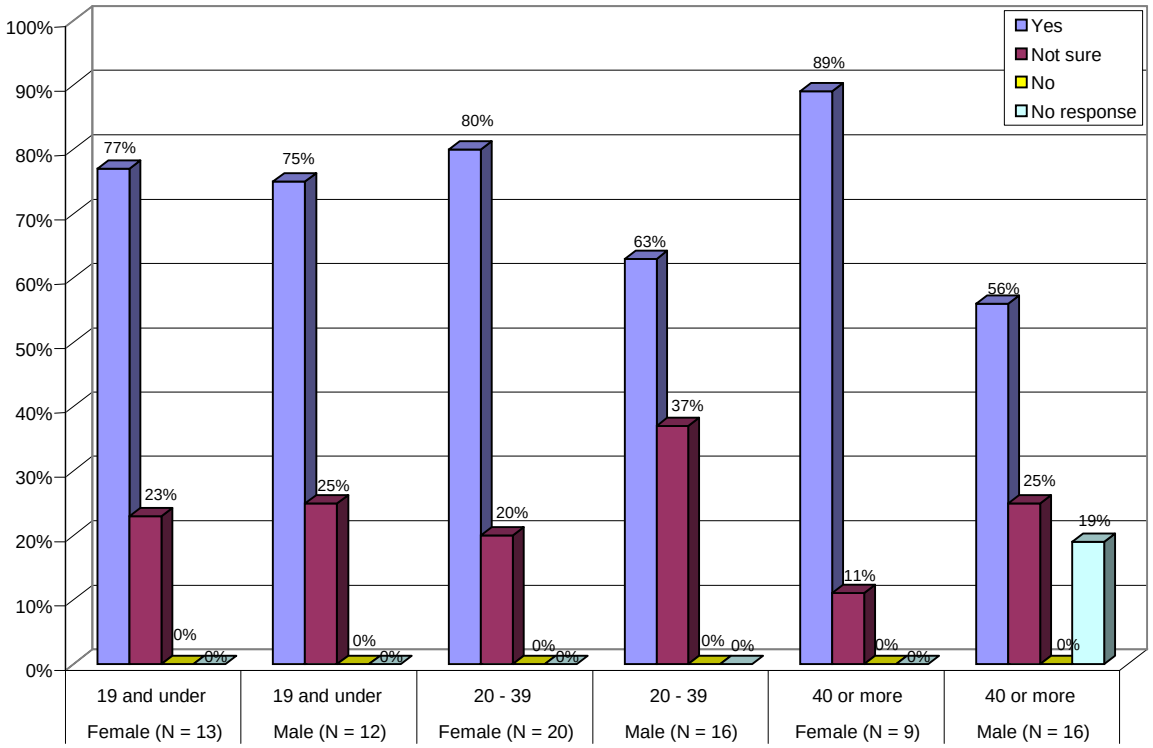


Fortification Kiosk

Figure 98. Did you find the information in the display useful?



Fortification Kiosk
Figure 99. Was it useful to have a section on how kids can help?



Fortification Kiosk
Figure 100. Did you see anything in this display that you might want to learn more about on your own?

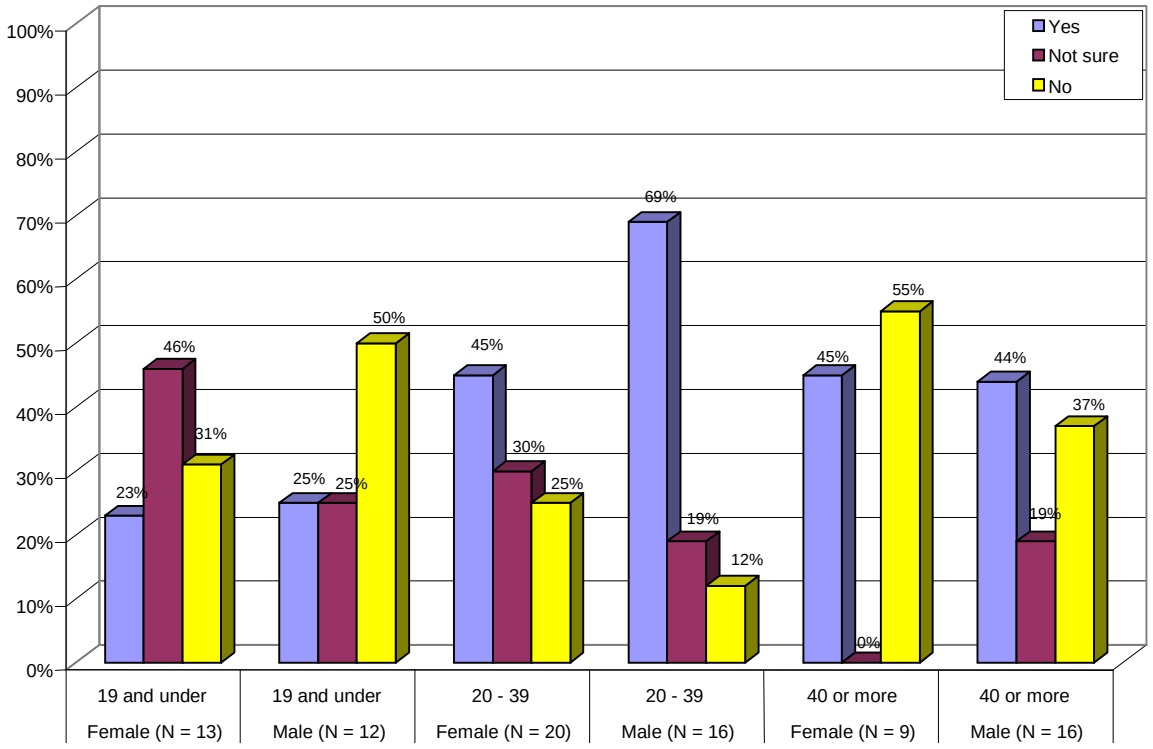


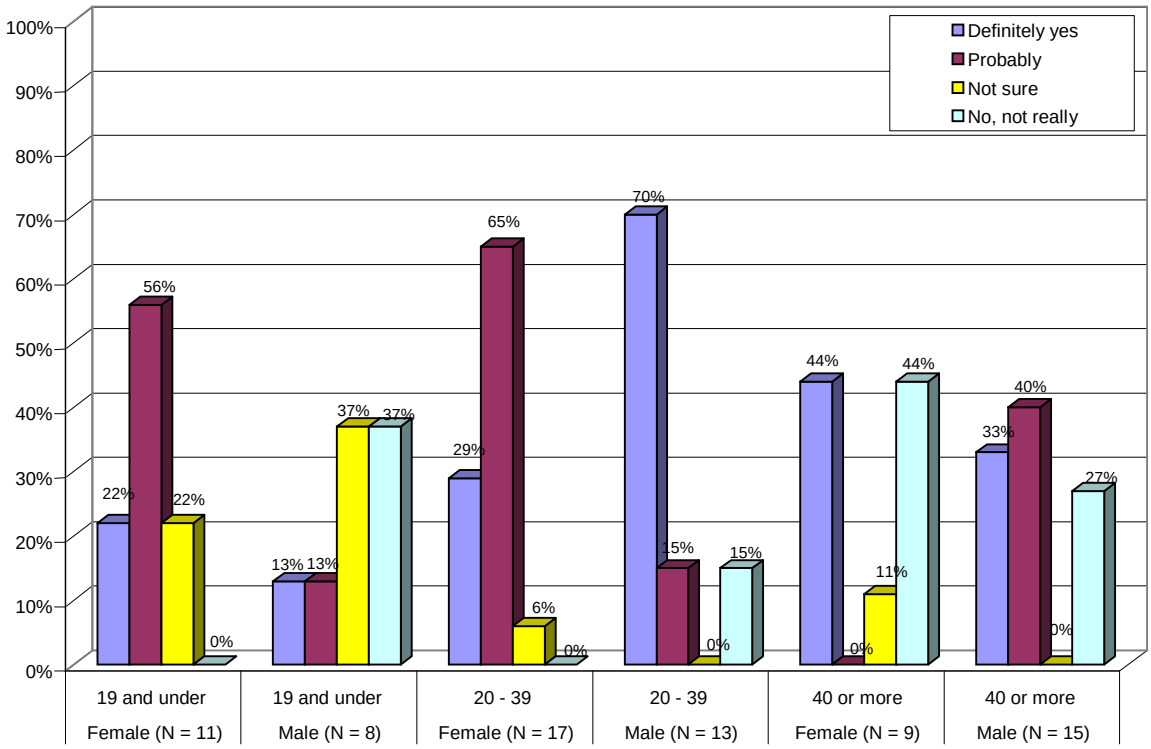
Table 49

If you saw something in the Fortification Kiosks that you might want to learn more about on your own, what might that be?

Age	Gender	
19 and Under		
	Female	• How to fix a damaged roof (Hail) • How they are caused (Tornado) • How to reinforce my home (Hurricane)
	Male	• Information about how to protect yourself from lightning • What to do after the disaster (Hurricane)
20 - 39		
	Female	• Preparedness information (Tornado) • Where it affects people most (Lightning) • Info on debris and resulting damage; more on preparedness (Hurricane) • Specific methods (Hurricane) • What about lightning fires (Wildfire) • Fortification (Hail) • Fortifying of roof (Hurricane) • More on injuries that it can cause (Lightning) • How things can be done with trusses (Volcano)
	Male	• It's link with thunder (Lightning) • Hail impact material • How the weather channel can be more accessible to people (Hurricane) • More expensive solutions (Lightning) • Things to install in and on your house, like siding (Hail) • Affect of wind speed on buildings (Hurricane) • How to tell when lightning is close enough to be a problem • Where to get hurricane proof materials • Predicting hurricanes • How it affects large buildings (Lightning) • About the benefits of living near a volcano – what might that be?
40 or More		
	Female	• What to do when it happens (Wildfire) • Lightning detector • Fortify your house – the spark arrester (Wildfire) • Lightning and distance from storms
	Male	• Fortifying the home (Lightning) • How to protect the appliances in your home (Lightning) • More depth on what to do in case of wildfire • My Fortified House (Hurricane) • Chimney sparks arrester – roof sprinkler system (Wildfire) • Sprinkler system (Wildfire) • I do outdoor work so it may be useful to know when to stop and seek shelter (Lightning)

Fortification Kiosk

Figure 101. Do you intend to reexamine your own home and surroundings in terms of reducing the risk from this natural hazard?



Visitor Reactions to *Disasterville's* In Case of Emergency (I.C.E.) Plan

Introduction

Visitors to MOSI's Disasterville were invited to engage the In Case of Emergency (I.C.E.) Plan display and were then interviewed regarding their reactions to the display. The interview questions were contained on a one-page form; the typical interview was completed in less than a minute. The interviewees were also asked to rate whether or not the display appealed to them, and to explain their rating. A total of 59 visitors varying in age and gender were invited to examine the display, and then were interviewed regarding their reactions to the display. The data were collected between January 20 and February 3, 2007.

The display containing the I.C.E. Plan uses a touch screen approach to present information that one should consider when preparing an emergency plan to meet a potential natural disaster such as might occur in the event of a hurricane or flood. The touch screen technology allows viewers to highlight those elements of information that are particularly applicable to them. The display informs the reader that they will have the capability to e-mail the highlighted information to their home computer, but this capability is not yet operational The display can comfortably accommodate two visitors at a time.

Summary of Results

Observations

Based on unobtrusive observations, the duration of engagement with the I.C.E. Plan by the invited visitors ranged from less than 50 seconds to well over 3 minutes. The great majority of invited visitors spent one or more minutes with the display. Compared to others, young visitors (19 and under) tended to take more time to complete the display (Figure 102).

Ratings

When presented with a three point scale on which to rate whether the I.C.E. display appealed to them (yes, somewhat, no), the invited visitors responded differently, depending on age. Those who were 40 or more were the most affirmative in their ratings, with 83% of females and 70% of males responding "yes". Those who were 20 to 39 were also generally affirmative. Compared to others, the 19 and under visitors were generally less positive in their ratings of the display (Figure 103). Those visitors who indicated that the I.C.E. display appealed to them most often cited as their reason the usefulness of the emergency planning information the display provided. Some liked it because they found it to be easy to understand or user friendly (Table 51). The minority who found the display unappealing most often cited the following as their reason: The display is not very noticeable, or it is not very exciting or attractive (Table 52).

Interviews

All invited visitors were interviewed regarding their reactions to the I.C.E. display. Asked if they had ever prepared an emergency plan before, the interviewees gave responses that varied somewhat by age. Those 19 and under tended to answer "no". The adults were more or less evenly split in their responses; about half indicated that they had prepared such a plan before and about half said they had not (Figure 104). Almost all of the interviewees, regardless of age or gender, indicated that they found the I.C.E. information "very easy" or "fairly easy" to read and understand (Figure 105).

Learning and Perceptions

Almost all of the interviewees indicated that the I.C.E. display gave them a "much greater" or "somewhat greater" appreciation for the importance of an emergency plan. Across the three age groupings, female interviewees tended to give somewhat more positive responses than male interviewees (Figure 106). Almost all of the interviewees also indicated that they

learned useful things to include in an emergency plan. Across the three age groupings, female were somewhat more likely than males to say that they learned "lots of useful things" from the display (Figure 107). When asked, "Did you see anything related to emergency planning that you might want to learn more about on your own?" about half of the interviewees responded "yes". Most of the rest responded "not sure". The most affirmative responses came from females 19 and under and males 40 or more (Figure 108). Those who responded affirmatively to the question were asked to indicate what they might want to learn more about. The most frequently occurring responses concerned the location of shelters or information about evacuation routes. Also frequently mentioned was information concerning household pets (Table 53). Asked if, based on what they saw in the I.C.E. display, they intended to build an emergency plan of their own, about three-quarters of the interviewees answered "definitely yes" or "probably". In each of the three age categories, the most affirmative responses came from female interviewees (Figure 109).

When given the opportunity to suggest changes that would make the I.C.E. display more useful or more informative, the interviewees offered a variety of ideas. Several suggested adding the e-mail capability that had been mentioned on the opening screen. Several others thought the reading level should be lowered to make it more suitable for children. Still others noted that the display should be made more attractive so that it could grab people's attention. Finally, several complimented the display for its comprehensiveness and simplicity and suggested no changes (Table 54).

Tables and Figures on I.C.E. Plan

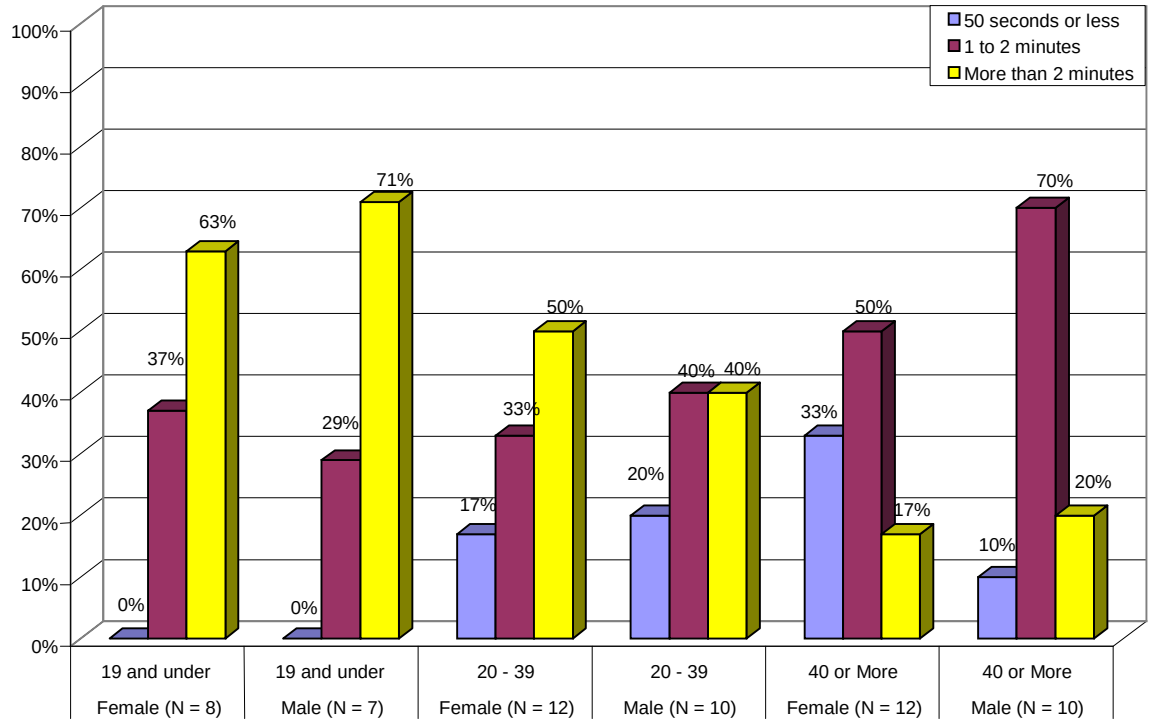
Table 50

Number of Observations and Reactions on I.C.E. Plan, by Gender and Age

Approximate Age	Gender	No.	%
19 and Under			
	Females	08	
	Males	07	
Subtotal		15	(26)
20 – 39			
	Females	12	
	Males	10	
Subtotal		22	(37)
40 or More			
	Females	12	
	Males	10	
Subtotal		22	(37)
Total		59	(100)

I.C.E. Plan

Figure 102. Duration of Engagement by Gender and Approximate Age



I.C.E. Plan

Figure 103. Did I.C.E. Plan Appeal to you?
(by Gender and Approximate Age)

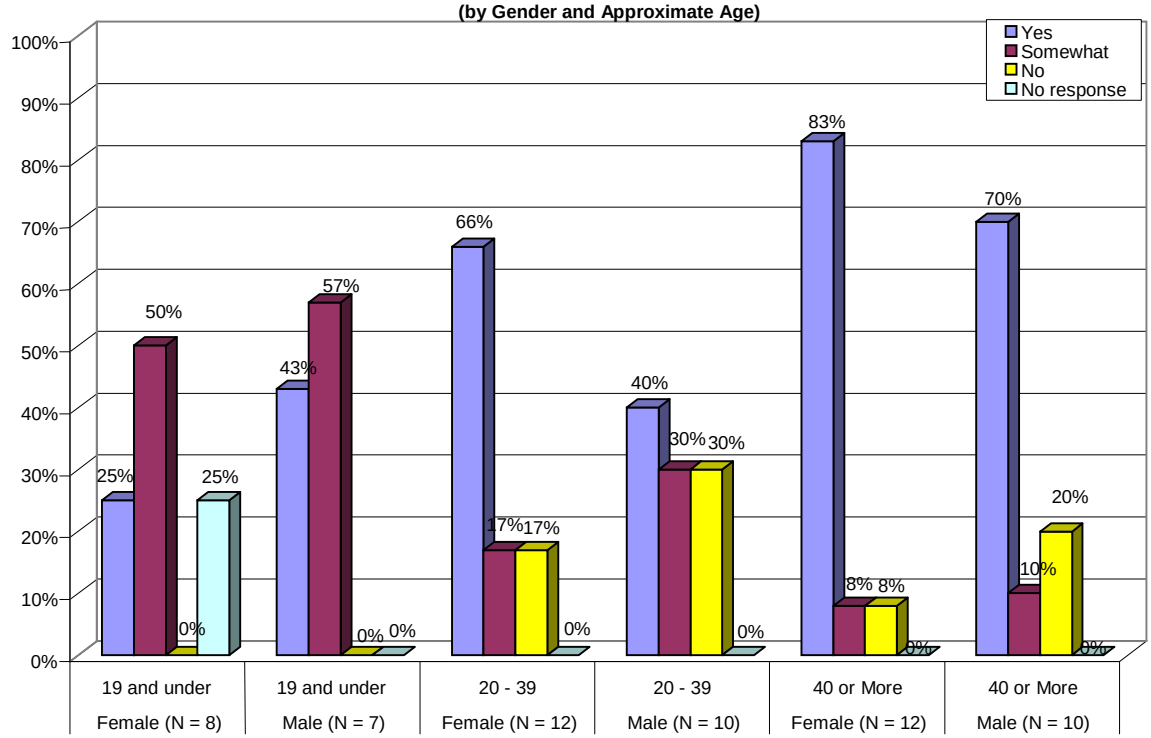


Table 51

If the I.C.E. Display Appealed to You, What was Most Appealing?

Age	Gender	
19 and Under		
	Female	• Important information we need to know • It's important for anyone living in Florida • Information was good
	Male	• Surprisingly, yes, because it is very complete • Helped me by teaching me things I need to know • Easy to read • Good information • Information is useful
20 - 39		
	Female	• It has information that we need • Easy to understand • It's got lots of useful information • Interesting—I learned a lot that I didn't know • Made me more aware of things I need to prepare for • Simple, straight forward • Very informative; tells you what to do in case of emergency
	Male	• Very comprehensive • Very informative • The information is important to protect my family • Got lot's of useful information
40 or More		
	Female	• Brings a lot of information to light that people need to know • Provided information that I needed • The information was very useful • It was presented very nicely • Not difficult to follow • Good information • It's colorful • It made you think • Very educational and motivational • Easy to understand, set out well
	Male	• Lots of information that people need to know • I found it more interesting than I expected • The information was useful • Very informational • Very good information • Simple; nice layout; informative • Self explanatory • Very user friendly

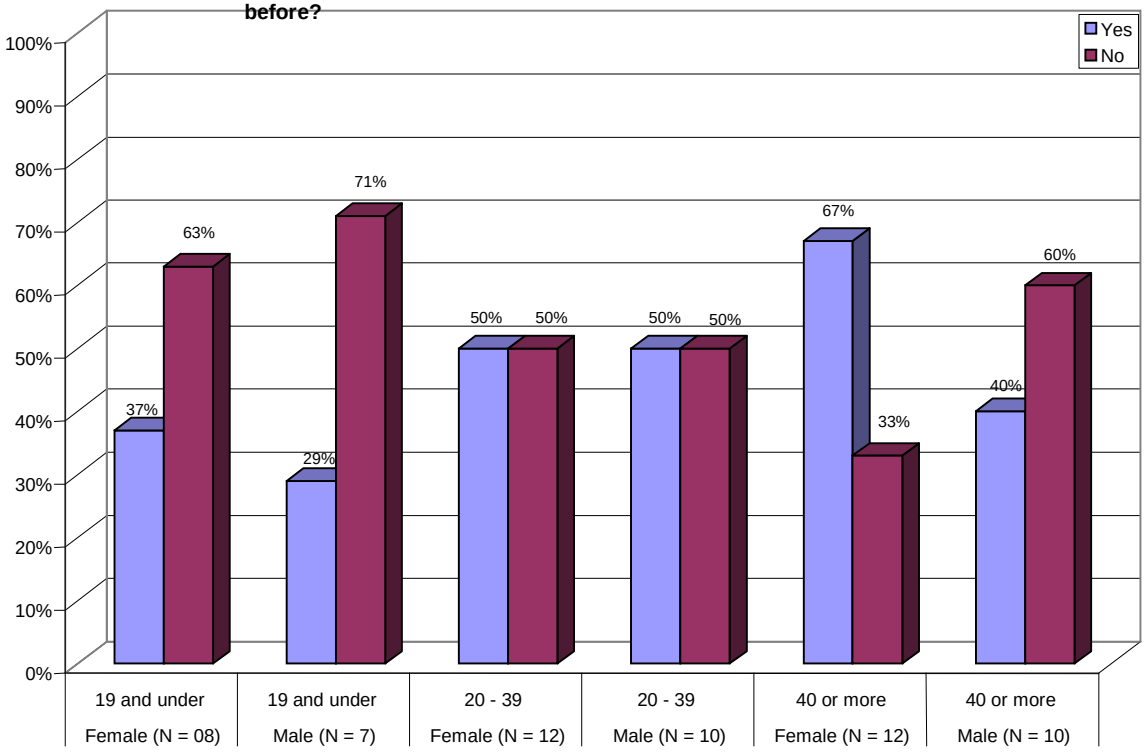
Table 52

If the I.C.E. Display Did Not Appeal to You, Why Not?

Age	Gender	
19 and Under		
	Female	• The display is not very noticeable • You don't notice it the way it is
	Male	• Not very noticeable—doesn't get your attention • Not noticeable, especially the way the screen is slanted
20 - 39		
	Female	• Information isn't oriented to the young or to non-homeowners • Not a very electrifying display • Not terribly attractive as you walk by • I don't need this information since I live in Ohio
	Male	• Not an attention-grabber; walking by, you don't even know it's there • This isn't oriented to the young or to non-homeowners • I've seen all this before—nothing new • Not very exciting • I don't care for these computer-type displays • Not very attractive to passers-by
40 or More		
	Female	• Not very exciting—just a listing • Not "touchy/feely" compared to things around it; just a flat screen
	Male	• It was long; lots to read • I would have walked right by—nothing about the set up that attracts me

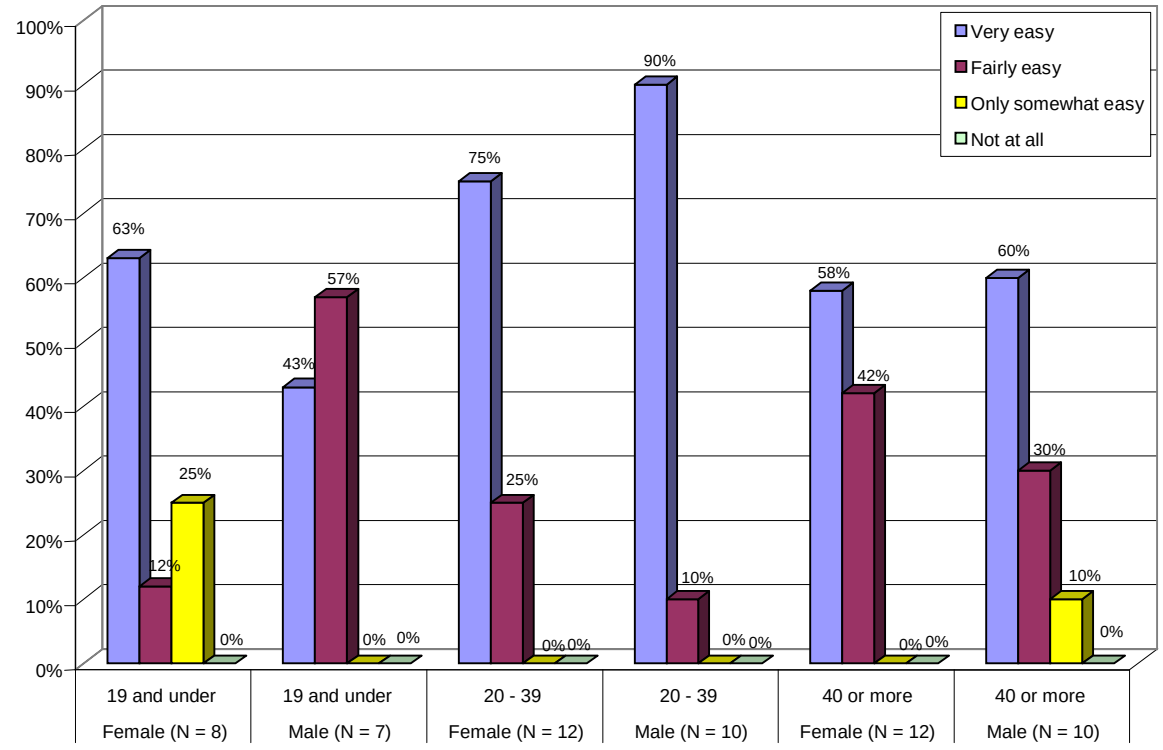
I.C.E. Plan

Figure 104. Have you ever prepared an emergency plan before?



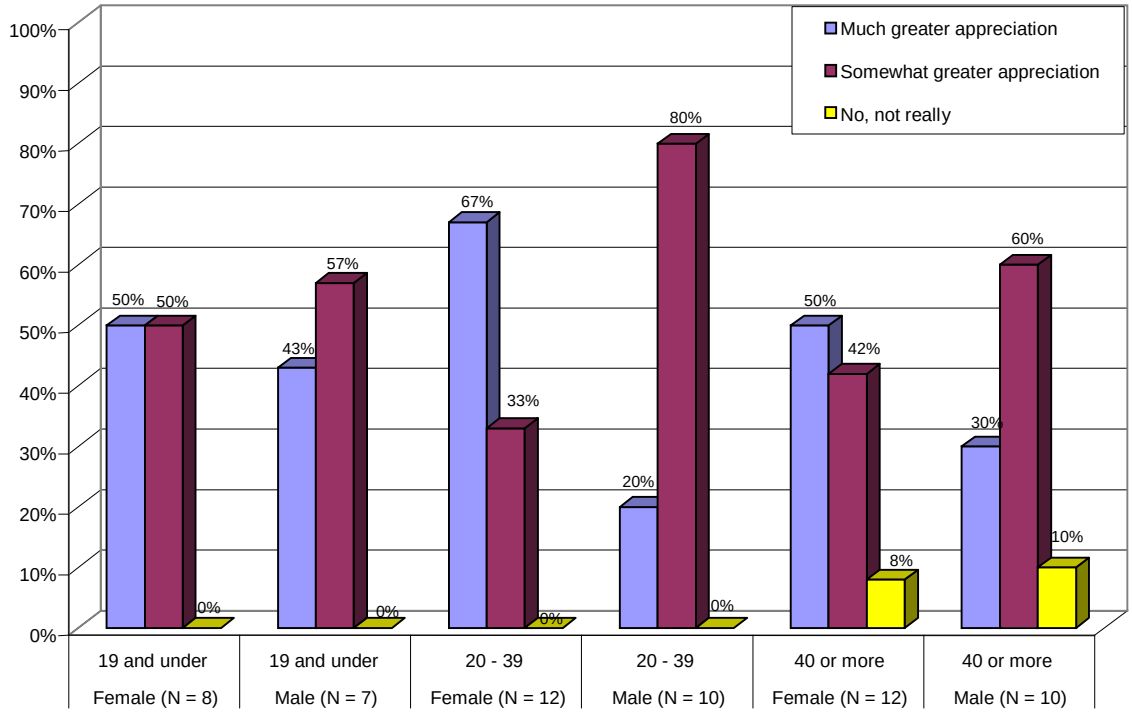
I.C.E. Plan

Figure 105. Did you find the I.C.E. information easy to read and understand?



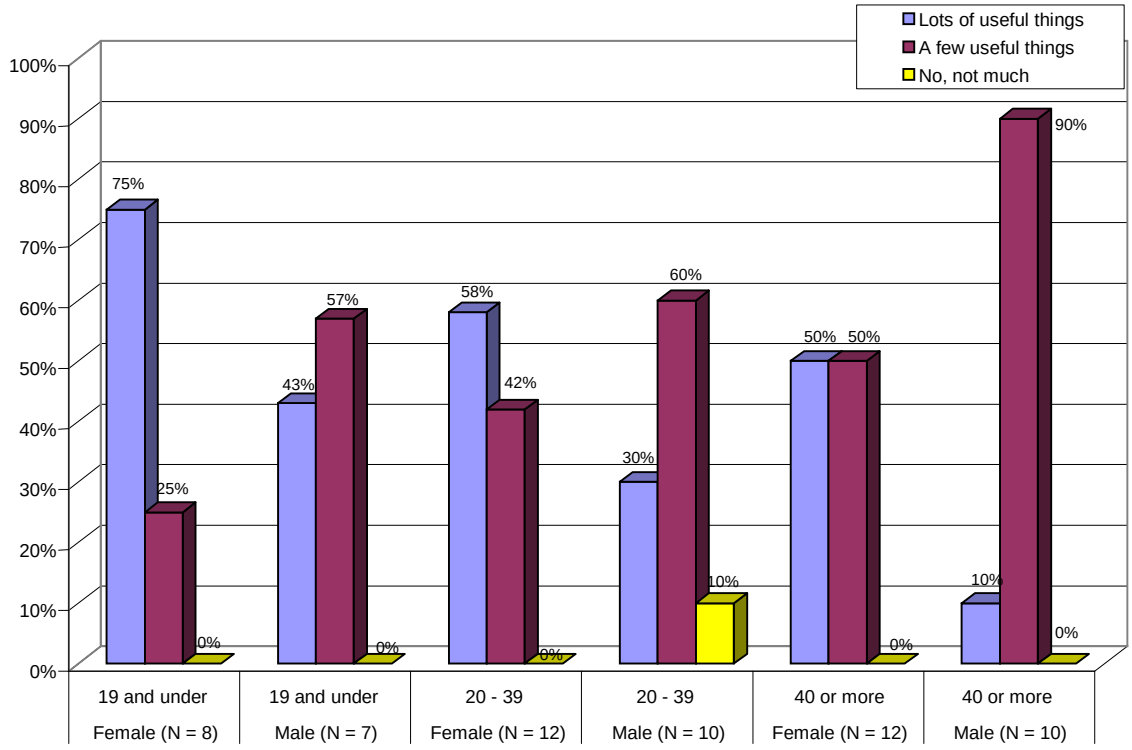
I.C.E. Plan

Figure 106. Did the I.C.E. display give you a greater appreciation for the importance of an emergency plan?



I.C.E. Plan

Figure 107. Did you learn some useful things to include in an emergency plan?



I.C.E. Plan

Figure 108. Did you see anything related to emergency planning that you might want to learn more about on your own?

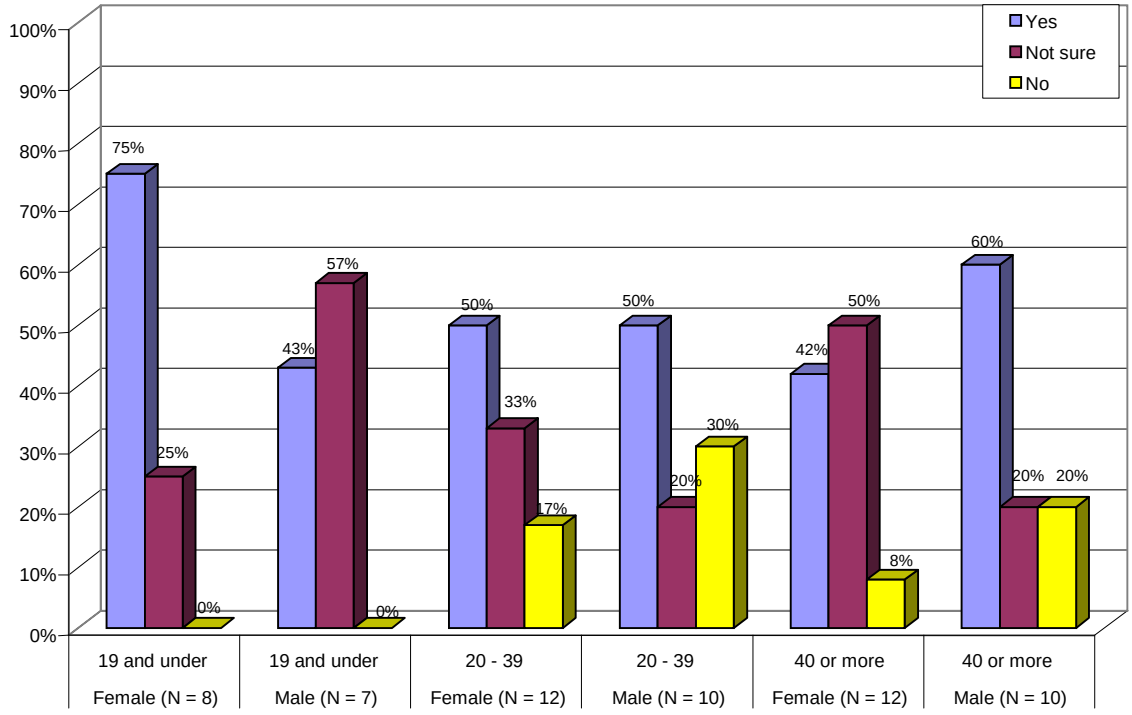


Table 53

If you saw something you might want to learn more about on your own, what might that be?

Age	Gender	
19 and Under		
	Female	• Taking care of pets • Employer's plan • Where pets are allowed to be kept • Wild fires • Where we should evacuate out of state and where we should send our pets • Video of possessions; how to exit the house
	Male	• All the stuff we need • Where to keep documents and how to keep them safe • Evacuation routes
20 - 39		
	Female	• Locations of shelters • Want to learn more about things needed on hand • Things to have on hand • I live in Nevada so floods and flood preparation • Location of shelters
	Male	• Emergency phone number list; food resources • Better escape route plans • Location of shelters; special needs information • Things to do with pets • Location of shelters
40 or More		
	Female	• What to do with pets • Evacuation notices • The medications needed • Medical supplies and source of medical care • Location of emergency shelters
	Male	• About pets • Using a common area to meet incase of emergency; things to take with you • The plastic bags for home • About how to take care of our pets • Food supply • Evacuations notices

I.C.E. Plan

Figure 109. Based on what you saw in the I.C.E. display do you intend to build an emergency plan of your own?

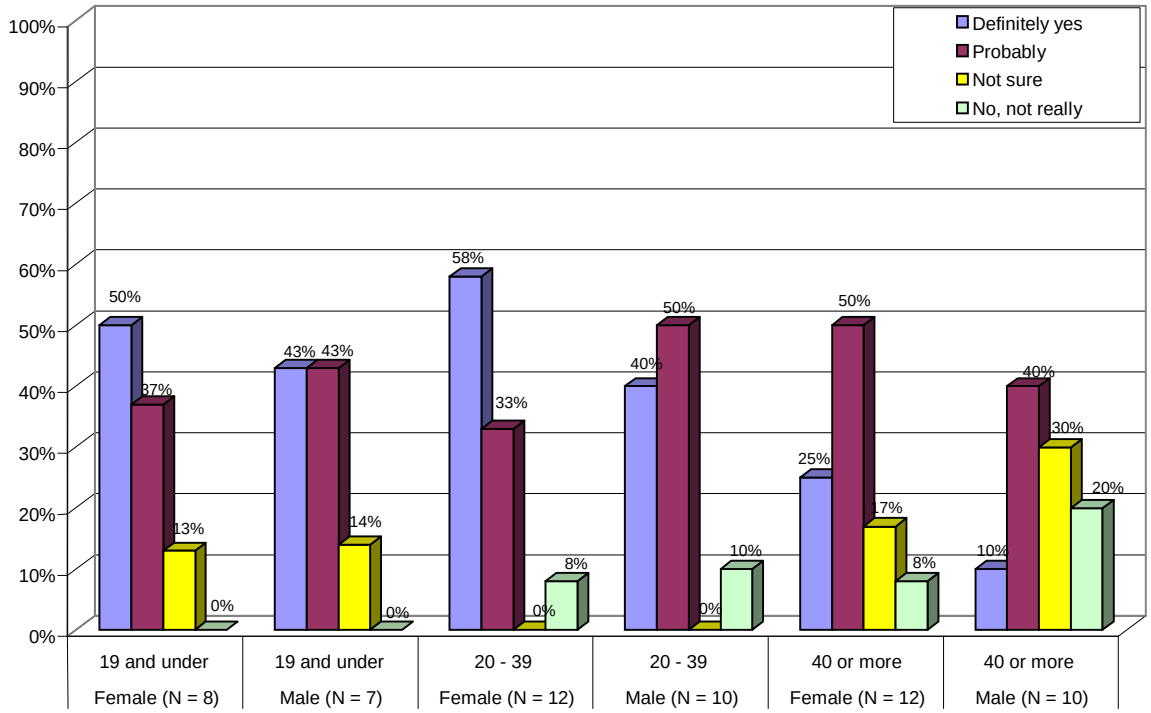


Table 54

What changes, if any, would make the I.C.E. display more useful or more informative?

Age	Gender	
19 and Under		
	Female	• A lot more on evacuation routes and things we need to be prepared if a storm does hit • Need easier wording for younger
	Male	• No, it was easy to read and fill out • Get in more out in the open – make it more attractive
20 - 39		
	Female	• Very informative • Very complete, add the e-mail element • Fix the e-mail
	Male	• Very comprehensive; I like it • Add e-mail element; a way to research anything you don't know about • Give assistant in actually making a plan, e.g., give information as to where the shelters are • Add e-mail element
40 or More		
	Female	• Readability is a bit difficult – some difficulty words • Should have different levels of detail for those who already know a lot or those who know little • Add something to space above the screen to let people know what this is about • Have something to take with you – a print out of the list because I won't remember after I walk away • Add an example of an emergency plan – how it would be formatted • Leave it as it; its not highly interesting but its simple
	Male	• Give out pamphlets • I think it should be formatted as a complete list of what needs to be done rather than selecting different things • Needs to have something to grab people's attention • Cut down on the reading load • Add e-mail element • It's too basic: needs more detail

Visitor Reactions to Bay News 9 WeatherQuest

Introduction

The evaluators gathered participant reactions from four groups of students who experienced Bay News 9 WeatherQuest. Participants' reactions were captured using a one-page reaction form that took less than two minutes for respondents to complete. The questions were kept as simple as possible to assure that the participants could understand and respond. Completed reaction forms were obtained from a total of 79 participants attending one of four WeatherQuest sessions, three offered on December 5 and one offered on December 10, 2006. All four sessions took place in the Bay News 9 WeatherQuest facility on the second floor of MOSI. Three of the participant groups were comprised of 57 students in the intermediate grades (three through five). The fourth group was comprised of 22 members of MOSI's Kids in Charge (KIC) Advisory Committee; these students ranged from grades five to ten, with most in the middle school grades (six through eight).

WeatherQuest is a simulated television studio that gives participants the opportunity to play various newsroom roles in the process of dealing with the tracking of a hurricane, its approach and arrival in the Tampa Bay area, and its aftermath. The newsroom studio is configured to accommodate up to 18 participants playing the following roles: Scientist (4), emergency manager (4), reporter (4), producer (2), director (1), television news anchor (2), and television weather presenter (1). Any of the roles can be shared by a second person if the participant group exceeds 18. Participants playing the roles of scientist, emergency manager and reporter operate touch screens to select and send visual and printed information to the producers, who in turn use touch screens to select and forward some of the information to the director. The director then makes the final determination as to which news stories will be presented by the news anchors and the weather presenter. Participants performing the roles of news anchor and

weather presenter appear on studio television screens along with the visuals pertaining to the stories they are presenting. MOSI representatives are on hand to orient the participants to their various roles and to oversee all activities. As the session progresses, participants are allowed to assume different roles. The typical session lasts about 35 minutes.

Summary of Results

Most of the female and male respondents in both the intermediate and KIC groups reported that they watch the weather on television "sometimes". Relatively small percentages of the students reported watching "always" or "never" (Figure 110). The two groups differed in response to the question "Was WeatherQuest fun?" Most of the female and male intermediate students marked "Lots of fun". The KIC males responded similarly, but the KIC females were somewhat less positive, showing an overwhelming preference for the response "Mostly fun" (Figure 111).

Roles Played

When queried about the specific role(s) they played during the simulated weather reporting, most of the females and males in each group reported assuming more than one role. Some reported performing three or more roles (Table 56). Because of the greater availability of such roles as Scientist, Emergency Manager and Reporter, these three roles tended to be performed by fairly large percentages of students in both groups; a particularly high percentage of KIC females reported serving as Scientist and Reporter. The roles of Anchor Desk and Green Screen were also fairly popular because many students wanted to see themselves on television, and MOSI representative tried to honor such requests (Figure 112). When asked, "Did you like the role(s) you performed?" most of the female and male respondents in the intermediate group indicated that they "liked it a lot". Most of the female and male respondents in the KIC group indicated that they "liked it some". Interestingly, the most positive responses were from the

female intermediate students; the least positive responses were from the female KIC students (Figure 113). In response to the question of how easy or hard their roles were to learn, most of the intermediate respondents and female KIC respondents indicated that learning their roles was "very easy". Male KIC respondents were more inclined to select "fairly easy" in response to the question (Figure 114). A majority of intermediate respondents and female KIC respondents also indicated that they had "no problems" working together with students playing other roles. A majority of male KIC respondents marked "A few problems" in response to this query (Figure 115).

When asked, "What did you enjoy most about WeatherQuest?" the respondents gave widely varying responses. Most identified with a particular role that they had performed, such as reporter or anchor. Some commented that they most enjoyed seeing the stories they had selected as a reporter, emergency manager or scientist being presented on the television screen. Still others remarked that they most enjoyed the realism of the experience; for example, one participant commented, "It made me feel like a weather man", and another noted "It felt like a real news report" (Table 57).

Learning and Perceptions

When asked, "Did WeatherQuest give you a better understanding of the teamwork needed to create televised weather reports?" most respondents in both the intermediate group and the KIC group indicated that they had acquired a "much better understanding"; the most positive response to this question came from the intermediate females (Figure 116). When asked whether WeatherQuest gave them a greater appreciation for television as a way of giving people information about natural hazards, most respondents in both the intermediate group and the KIC group indicated that they had acquired a "much greater appreciation"; again, the most positive response to this question came from the intermediate females (Figure 117). When asked whether WeatherQuest made them want to learn more about the science behind weather forecasts, the

responses varied within groups. Within the intermediate group, the females overwhelmingly responded that they "want to learn lots more"; intermediate males were somewhat less positive, splitting most of their responses between "want to learn lots more" and "want to learn a little more". Within the KIC group, the males were noticeably more positive than the females. A majority of males indicated that they "want to learn lots more", while the majority of females indicated that they "want to learn a little more" (Figure 108).

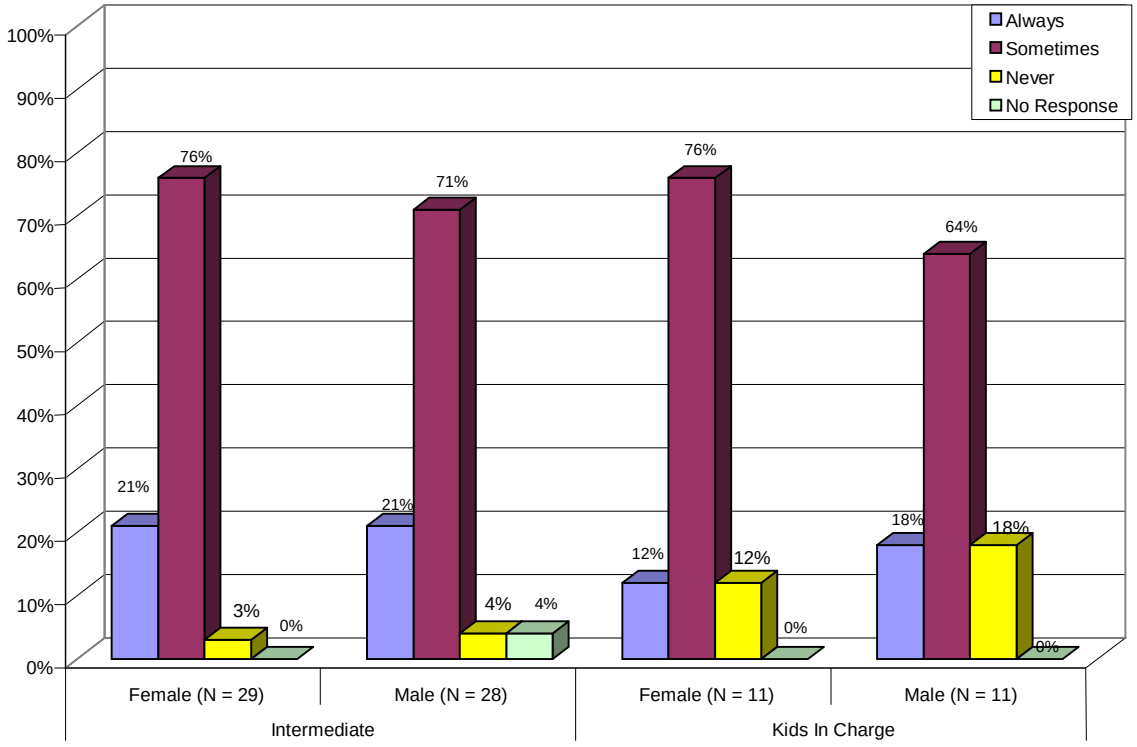
WeatherQuest Tables and Figures

Table 55

Age and Gender of Visitors To WeatherQuest

Group	Gender	No.	%
Intermediate			
	Female	29	
	Male	28	
Subtotal		57	(72)
Kid In Charge			
	Female	11	
	Male	11	
Subtotal		22	(28)
Total		79	(100)

WeatherQuest
Figure 110. How often do you watch the weather report on TV?



WeatherQuest
Figure 111. Was WeatherQuest fun?

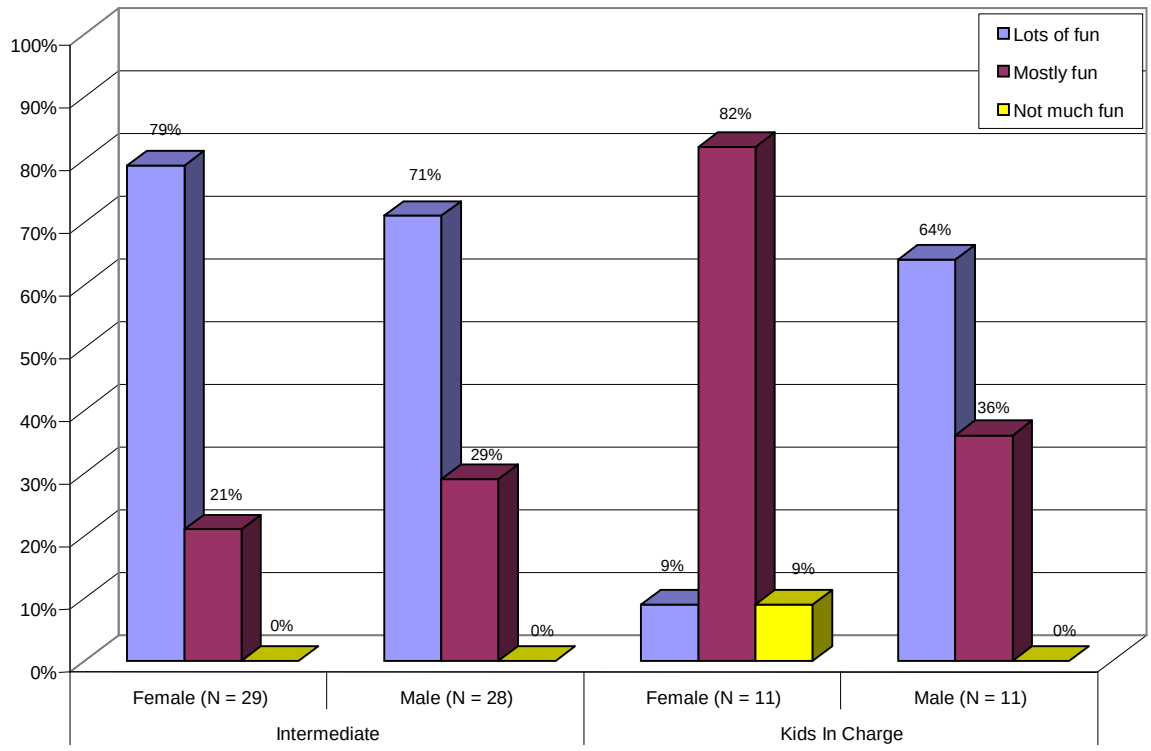
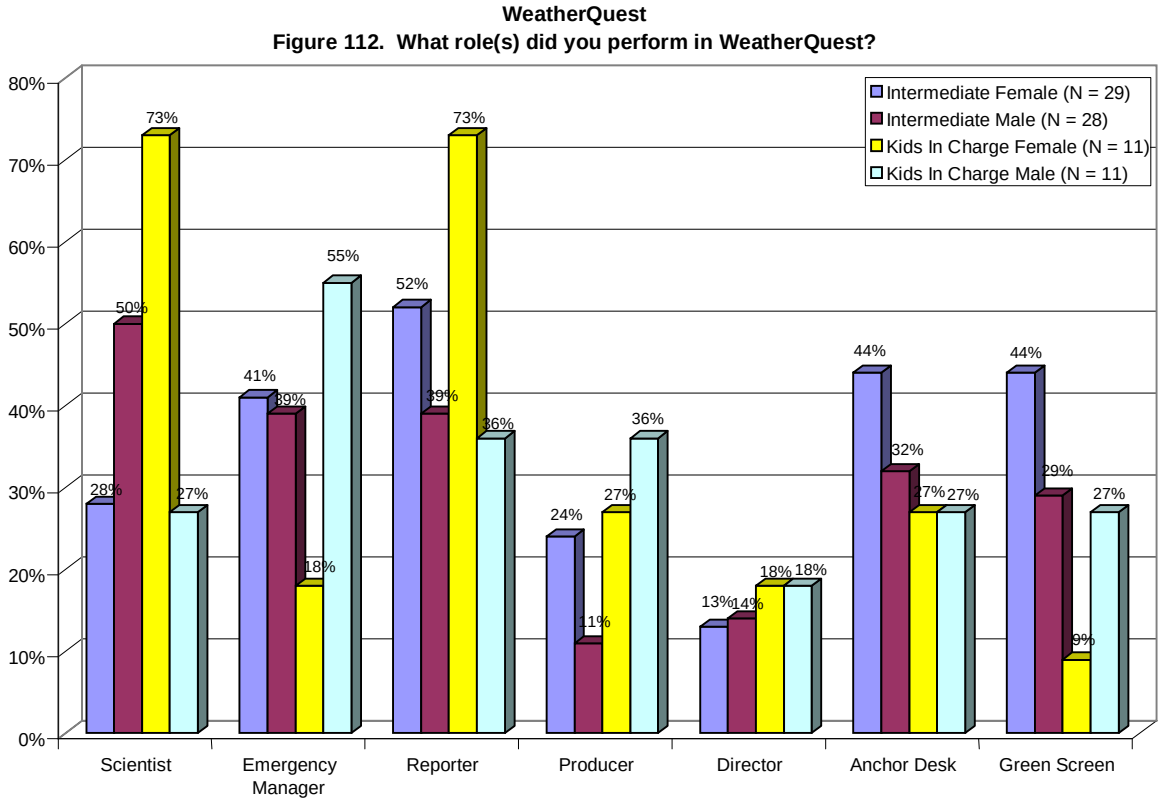


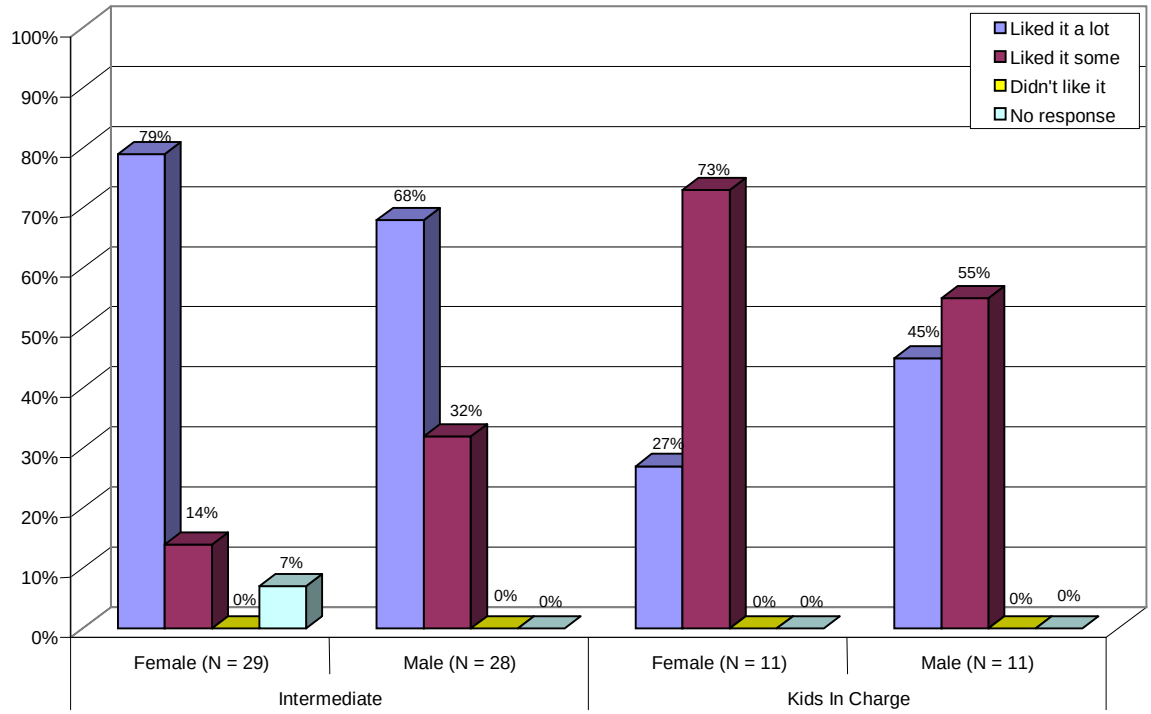
Table 56

Number of Roles Performed

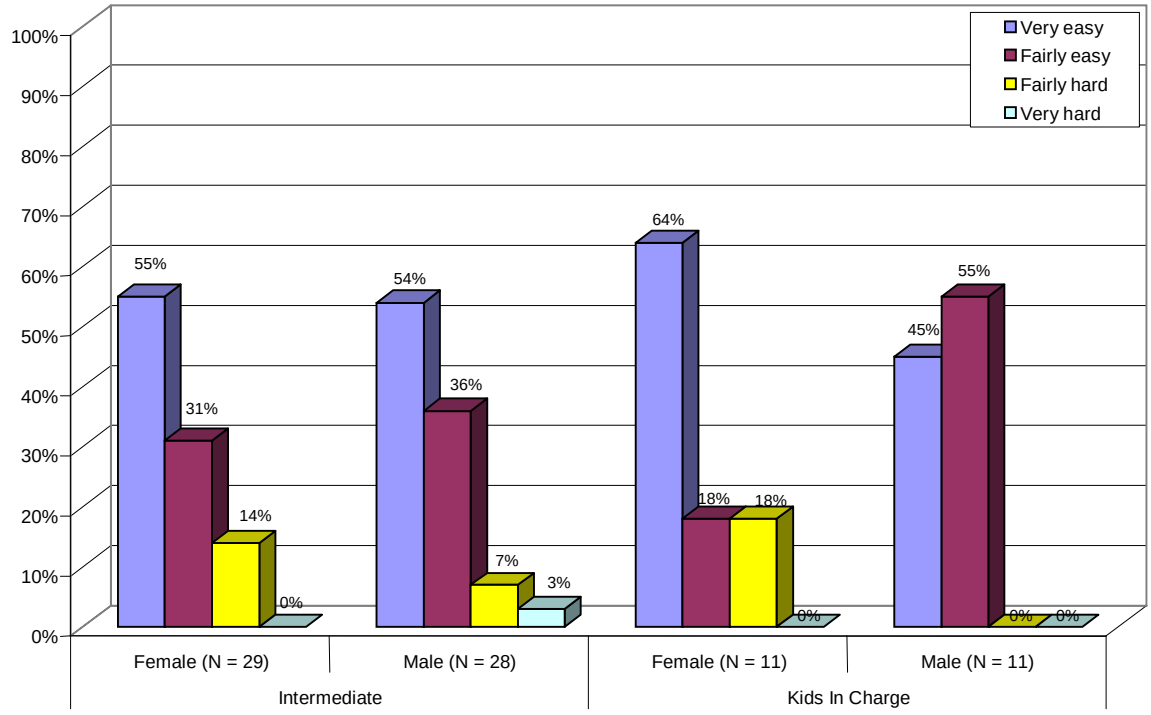
Group	Gender	Number of Roles Participated In				
		1	2	3	4	5
Intermediate						
	Female	**5**	**8**	**13**	**3**	
	Male	**9**	**9**	**7**	**1**	**2**
Kids In Charge						
	Female	**1**	**4**	**6**		
	Male	**3**	**3**	**4**	**1**	



WeatherQuest
Figure 113. Did you like the role(s) you performed?



WeatherQuest
Figure 114. Was it easy or hard to learn your role(s)?



WeatherQuest

Figure 115. Did you have any problems working together with students playing other roles?

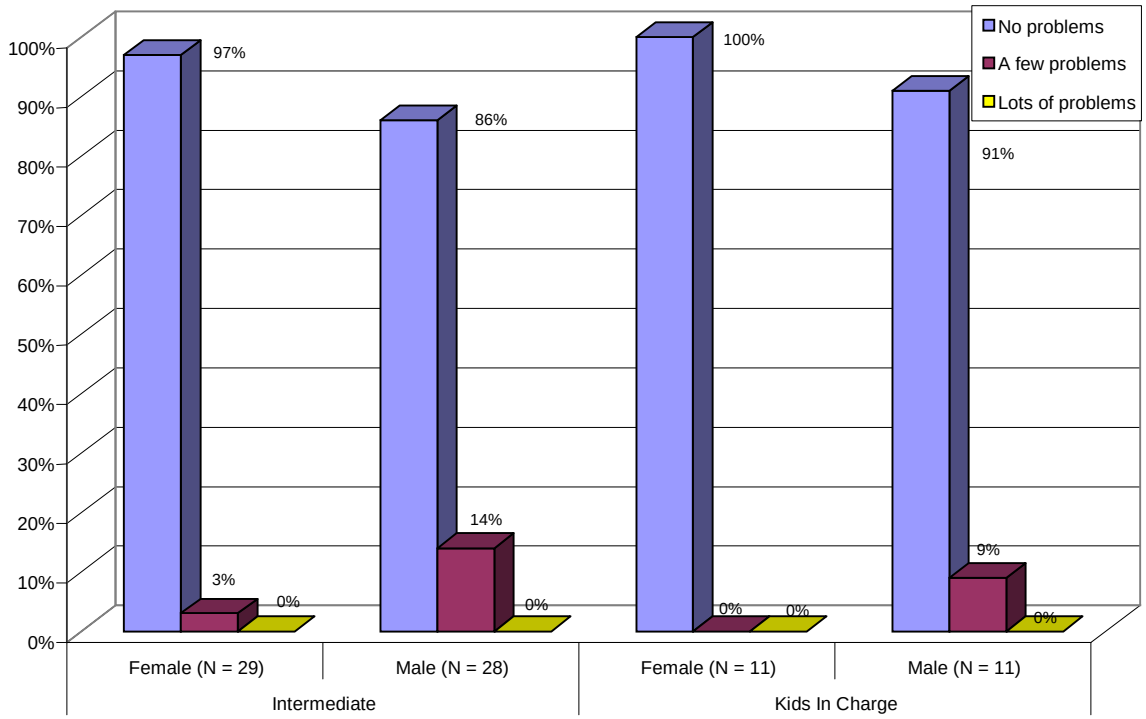


Table 57

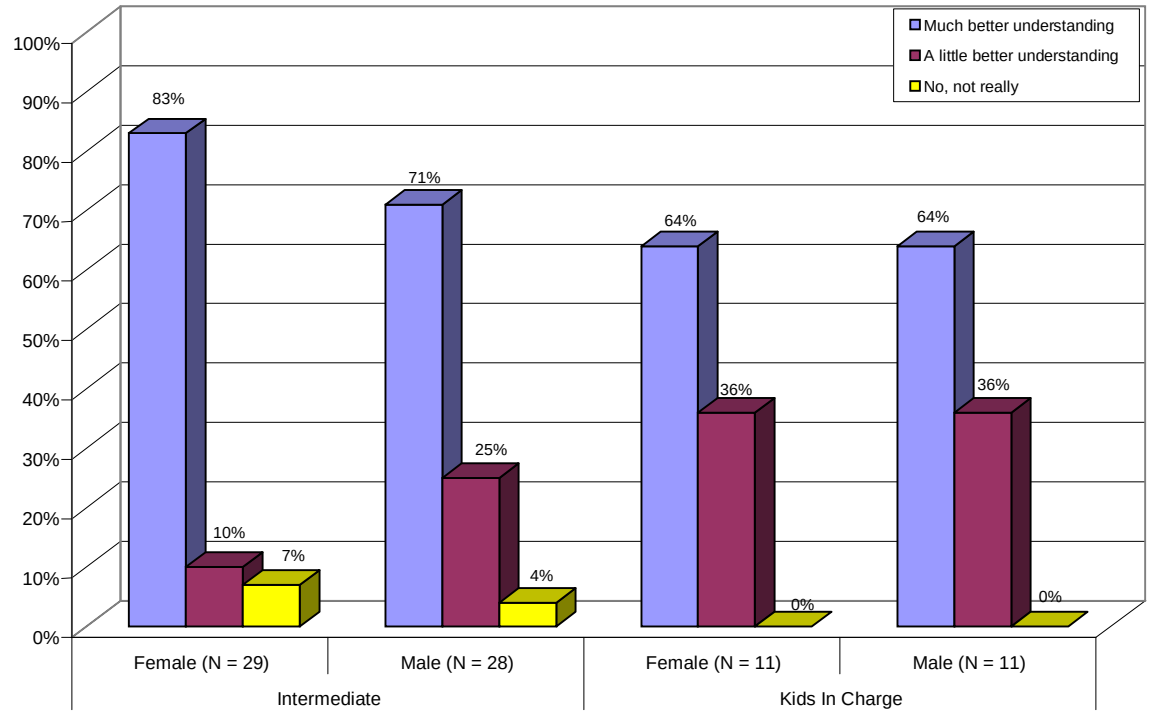
What did you enjoy most about WeatherQuest?

Group	Gender	
Intermediate		
	Female	• The green wall • Being a reporter and telling everyone news • The green screen because it felt like it was real • The anchor desk and reporting the news • I liked being able to report the stories • Being on the green screen • Being on TV • Getting to be on the green screen • Producer • What I enjoyed most was that I learned a lot about this and it was fun • Being on the green screen • Anchoring • I enjoyed being the reporter because I can send videos to people • Being able to press lots of buttons • Playing my role • The thing I enjoyed the most was being on the air • I enjoyed being on Green Screen most • I enjoyed doing the green screen • I enjoyed being a director • Anchor • Being anchor desk • Being the reporter • The Green Screen • You get to have an experience for the news • Being on the screen and doing emergency manager • That it seemed like we were really on TV • I enjoyed being at the anchor desk • Feeling that I was helping people • Everything
	Male	• Making the forecast and being a scientist • Anchor Desk • Doing emergency manager • Learning about weather • Using the touch screen • All of the different roles • Touch screen computers • Being a scientist • Being an anchor • Being emergency manager • All the different jobs I did • Scientist • Being the scientist • I like the director • The reporter • Being the anchor • Reporter • That you can make the anchor say the story • Picking stories and weather reports

	Male	• The scientist role • Green screen • Being the anchor • When I went on green screen • Pin point computer • When you get to be on TV, and I like to send stuff to the producer • Anchoring and being the emergency manager • That it gave us an idea of news casting
Kids In Charge		
	Female	• Being able to be with your friends and learning how a real weather channel works • Pushing and choosing the buttons on the screen • Watching the people on TV • How we got to do different jobs and doing the green screen • I liked sending reports to the emergency manager and seeing how the hurricane was getting closer to Florida. It felt like a real news report • Being the scientist • Seeing the videos of the ocean • It shows you what real people do for a living • I enjoyed sending stories to the producers. • I enjoyed working at the anchor desk the most • Sending the alerts to the producers.
	Male	• Watching our own stories appear on the screen • Watching the news we made • It made me feel like a weather man • The most I enjoyed about Weatherquest is it was interactive • The anchor desk • Being on the Green Screen • The stories on the news were realistic • Watching anchors read my stories • I really liked how you could actually be on camera and actually decide the stories that went on the screen • The teamwork • Receiving new items, needs some sort of challenge

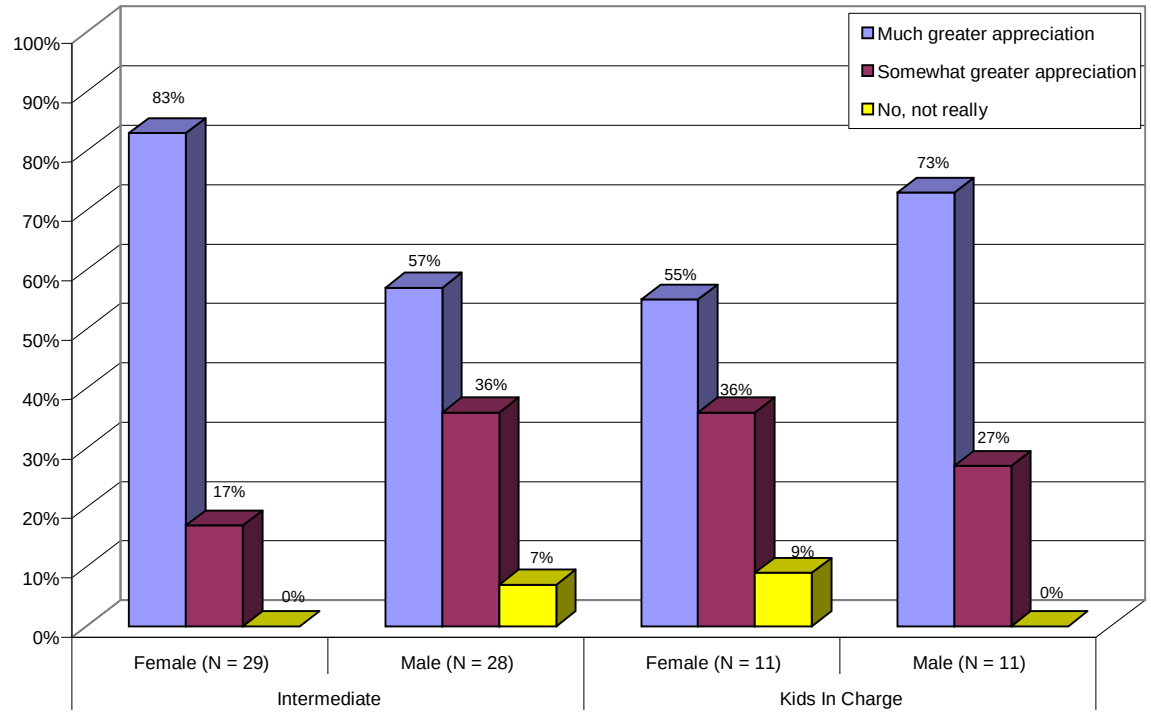
WeatherQuest

Figure 116. Did WeatherQuest give you a better understanding of the teamwork needed to create televised weather reports?



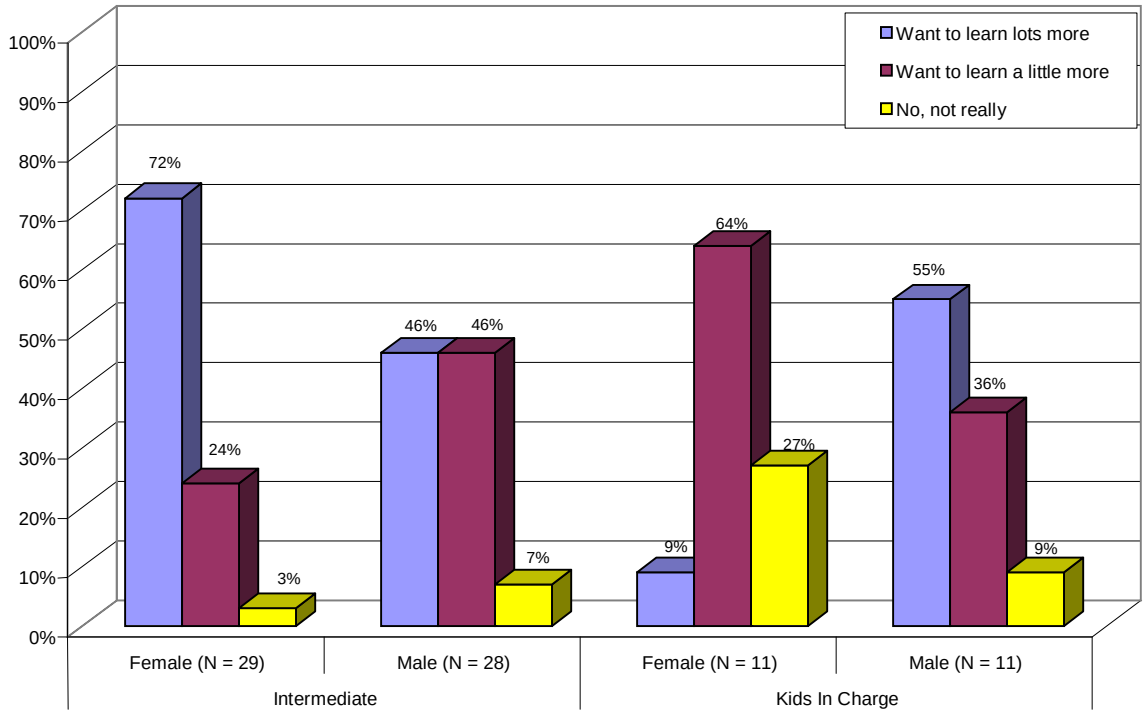
WeatherQuest

Figure 117. Did WeatherQuest give you a greater appreciation for television as a way of giving people useful information about hurricanes and other natural hazards.



WeatherQuest

Figure 118. Does WeatherQuest make you want to learn more about the science behind weather forecasts?



Visitor Reactions to "Recipe for Disaster" Stage Demonstration

Introduction

At the conclusion of the stage demonstration "Recipe for Disaster", audience members were invited by the evaluators to provide their reactions. Audience reactions to the demonstration were captured on a one-page reaction form that took less than two minutes for respondents to complete. The questions were kept as simple as possible to assure that audience members across a range of ages could understand and respond. Completed reaction forms were obtained from a total of 88 visitors attending one of three presentations of "Recipe for Disaster" on December 22, 23 and 26, 2006. All three presentations took place in the Science Works Theater on the third floor of MOSI. The respondents were about equally divided by gender. Just under half were age 19 or under. The evaluators also gathered unobtrusive observations on the presentation of December 26, 2006. The focus of the observations was on the extent of active audience participation and attentiveness.

"Recipe for Disaster" is a stage presentation that provides the audience with demonstrations focused on the properties of volcanoes, tornadoes, fire and electricity, and encourages the importance of being prepared in the event of a natural disaster. The show's moderator uses participants from the audience for each demonstration, particularly younger members. The show is about a half hour in duration.

Summary of Results

Observations

The stage presentation of "Recipe for Disaster" on December 26, 2006 was presented to about 50 visitors of varying ages. Among the audience were approximately 25 visitors age 19 and under, most of whom were adolescents or pre-adolescents. The remaining 25 visitors were

split fairly evenly between young adults (20 – 39) and older adults (40 or more). The audience was about evenly divided between females and males.

The stage presentation lasted about 30 minutes, and offered six demonstrations dealing with the science of volcanoes, fire, tornadoes and static electricity, and with aspects of emergency preparation. During the presentation a total of nine audience members, almost all adolescents or pre-adolescents, were invited up on stage to participate in five of the six demonstrations. While on stage, all eight were required to engage in some type of motor activity (e.g., selecting, classifying or identifying something), and all except one had the opportunity to respond to one or more questions related to the demonstration in which they were participants. All eight appeared attentive while on stage, and each appeared to be enjoying the experience. While the moderator directed most questions to the participants on stage, several questions regarding the science or danger of natural hazards were directed to the general audience. All members of the audience appeared attentive throughout the presentation, from beginning to end.

While formal observations were gathered only on the presentation of December 26, the other two presentations of "Recipe for Disaster" appeared to follow a very similar pattern. All three were high energy, high activity events with frequent opportunities for audience participation.

Audience Reactions

Most members of the audience indicated that they had not yet experienced *Disasterville* at the time they gave their reactions to "Recipe for Disaster". This was the case for all age by gender groupings (Figure 119). The overwhelming majority of respondents reported that the presentation was easy to understand (Figure 120). However, a few did suggest that the presenter could be heard better if a microphone were used (Table 59). The response to the question, "Was 'Recipe for Disaster' fun?" showed distinct differences across age. Those 19 and under were

much more likely to mark "Lots of fun" as compared to the adults--especially the older adults, who were most likely to mark "Mostly fun." But almost no one thought it "Not fun" (Figure 112). The question "What did you enjoy most about "Recipe for Disaster?" brought a variety of responses. Many cited the opportunity for audience members, especially kids, to participate; others noted the energy or enthusiasm of the presenter. Most however, identified one or more of the demonstrations as the most enjoyable aspect of the presentation; most frequently mentioned was the demonstration on static electricity (Table 59).

Learning and Perceptions

A distinct majority of respondents in all age by gender groupings noted that the presentation taught them "lots" or "a few" useful things about certain natural hazards. Those 19 and under were much more inclined to say that they learned "lots of useful things" than were the adults (Figure 123). In a similar pattern, a distinct majority across all age by gender groupings also noted that they learned useful things about making a Disaster Preparedness Kit. Again, those 19 and under were more inclined to say that they learned "lots of useful things" as compared to the adults (Figure 123). When asked, "Did 'Recipe for Disaster' make you want to learn more about what causes lightning, tornadoes, volcanic eruptions and other natural hazards?" the most positive response came from males 20 to 39, 57% of whom marked "Yes, I want to learn more". Affirmative responses from females and males 19 and under, and males 40 or more were also fairly positive. The least positive responses came from females 40 or more (Figure 124). When asked, "Did "Recipe for Disaster" make you want to learn more about what you can do to protect yourself and your home from lightning, tornadoes and other natural hazards?" the most positive responses came from those 19 and under, as well as from males 20 to 39; a majority of respondents in each of these categories said "Yes, I want to learn more". Again, the least positive responses came from females 40 or more (Figure 125).

"Recipe for Disaster" Tables and Figures

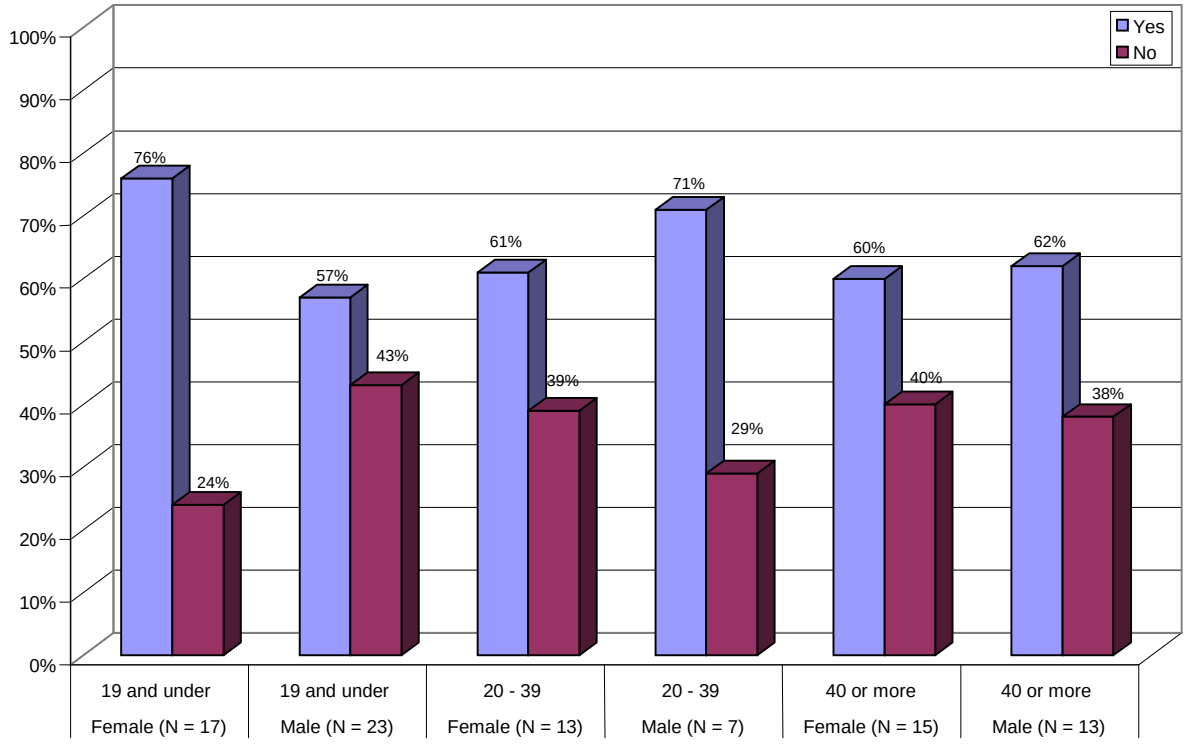
Table 58

Visitor Reactions to "Recipe for Disaster," by Gender and Age

Age	Gender	No.	%
19 and under			
	Female	17	
	Male	23	
Subtotal		40	(45)
20 – 39			
	Female	13	
	Male	07	
Subtotal		20	(23)
40 or more			
	Female	15	
	Male	13	
Subtotal		28	(32)
Total		88	(100)

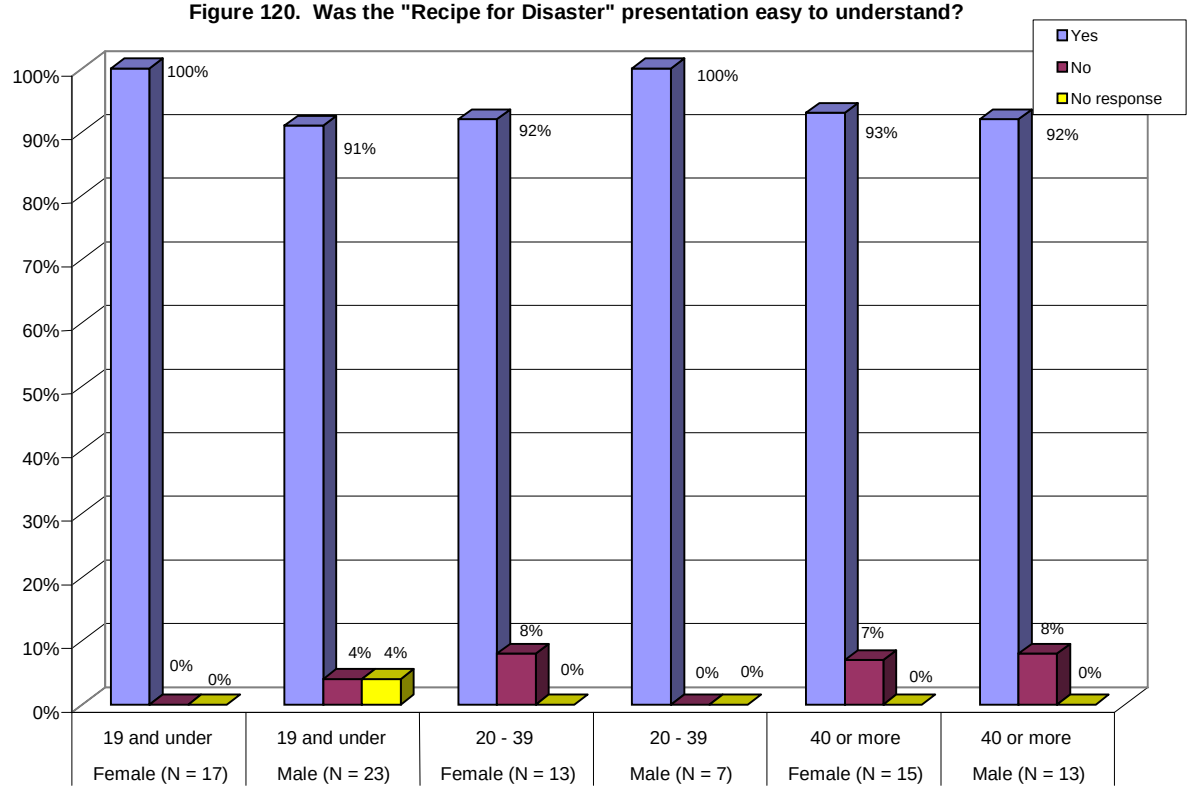
Recipe for Disaster

Figure 119. Have you been through MOSI's Disasterville on the 2nd floor?



Recipe for Disaster

Figure 120. Was the "Recipe for Disaster" presentation easy to understand?



Recipe for Disaster

Figure 121. Was "Recipe for Disaster" fun?

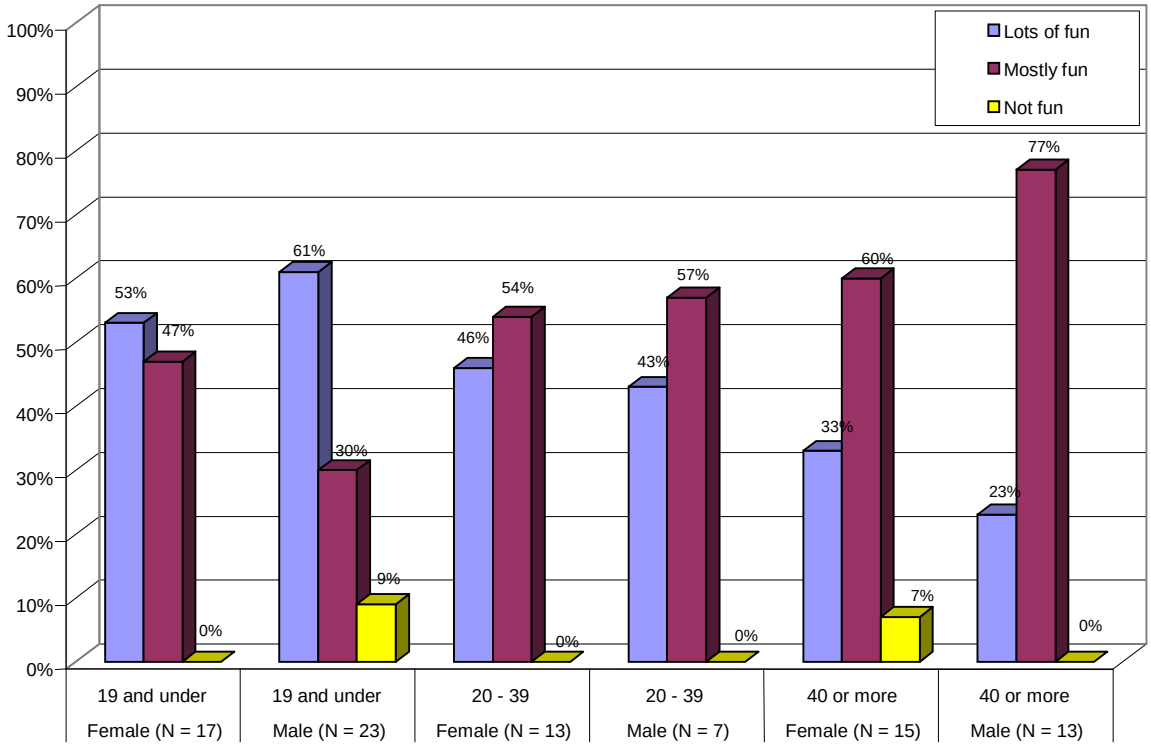


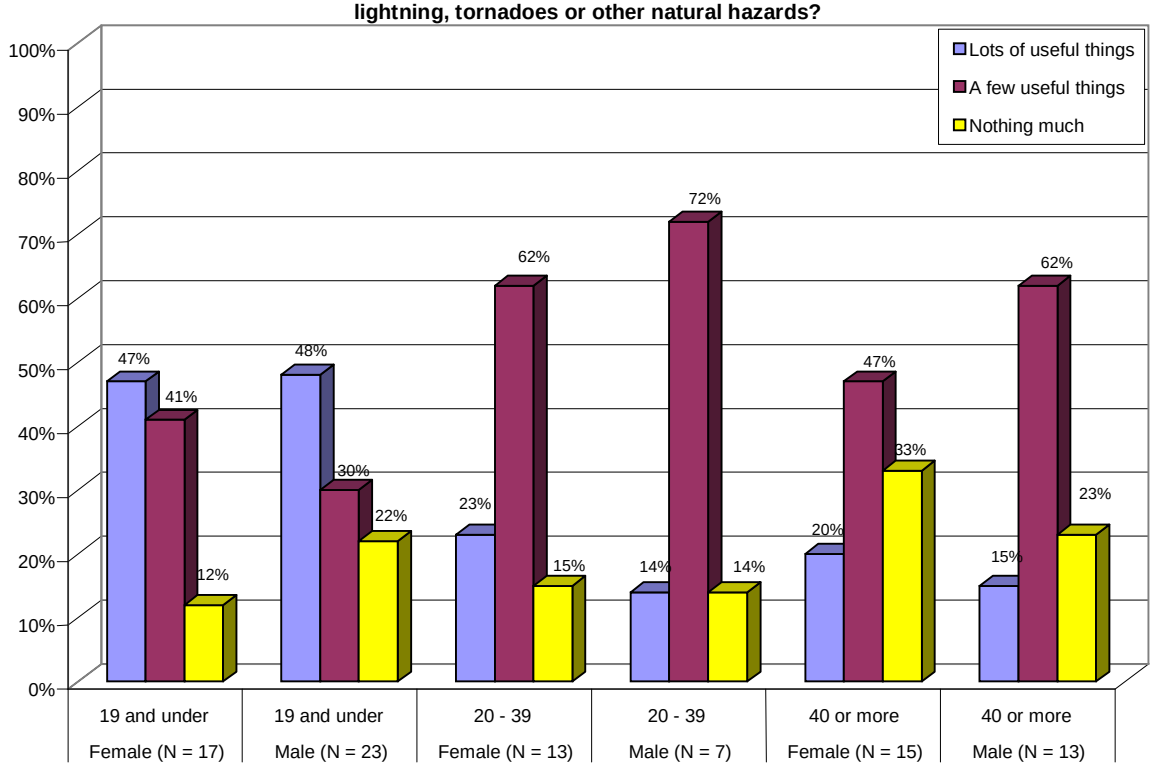
Table 59

What did you enjoy most about "Recipe for Disaster"?

Age	Gender	
19 and Under		
	Female	• Tornado thing • The lightning • The lightning • The lightning • The audience participation • Demonstrations were very interesting • Demonstration of how to make safety kits for natural disasters • I enjoyed the hands on stuff • The birthday cake • The static electricity thing
	Male	• Cake • Tornadoes • Fire • Hurricane and fire • Tornado Demo • The static electricity experiment • Awesome • The instructor • Made disaster • Preparation kit • Tornado • Disaster kit • Volcano, lightning • The fire and baking soda thing • The host was excited • The experiments • The twister
20 - 39		
	Female	• My kids got picked to go up front • Presenter is funny • Volcanoes • Getting to participate • Interactive, audience participation • Presenter was friendly and fun; this was high on fun but I wish there was more information • Static electricity • Experiments • Educational aspects • The personal humor wasn't entirely directed to kids • Funny and entertaining
	Male	• Static electric • Moved fast. Lots of involvement • The interaction with the kids and the different experiments

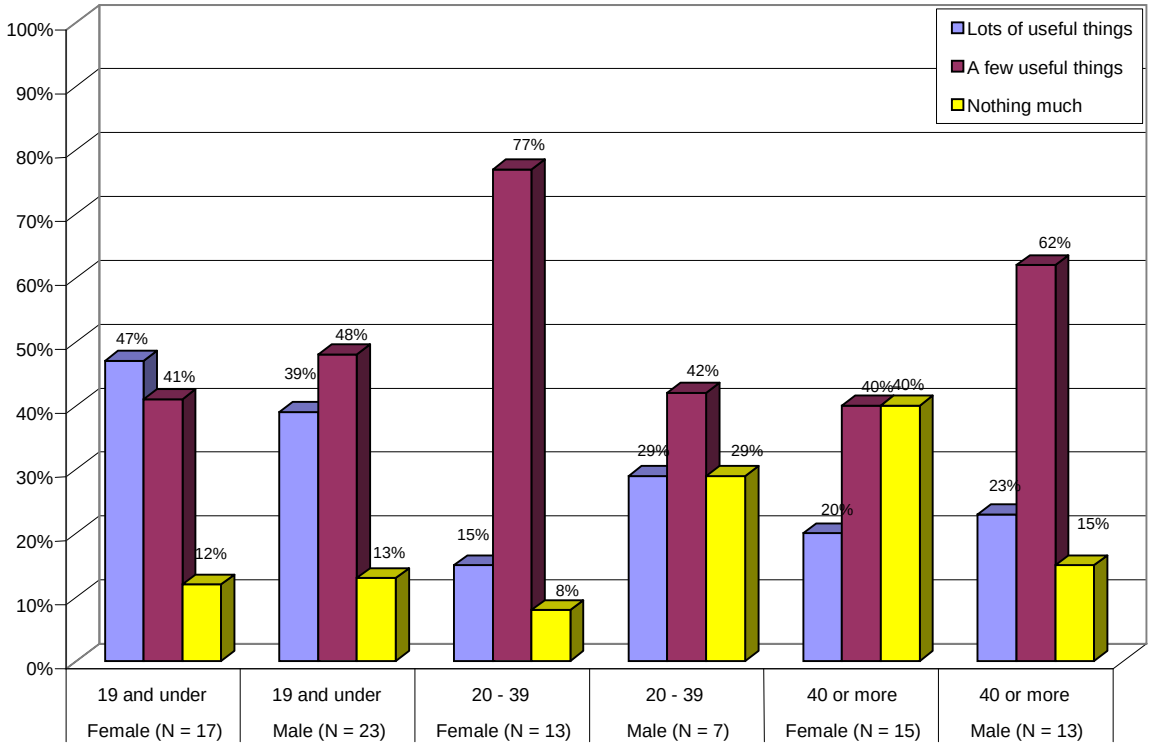
40 or More		
	Female	
		• Van de Graaff generator • Enthusiasm of presenter • What to prepare for • Audience interaction • Great presenter – lots of audience participation • Van de Graff generator • Seeing the kids interacting
	Male	
		• Electricity • Electricity/lightning demo • Understandable • Good show for children • Volcano • Static electricity • Fire extinguishing • I thought presenter had a lot of energy

Recipe for Disaster
Figure 122. Did you learn some useful things about volcanoes, lightning, tornadoes or other natural hazards?



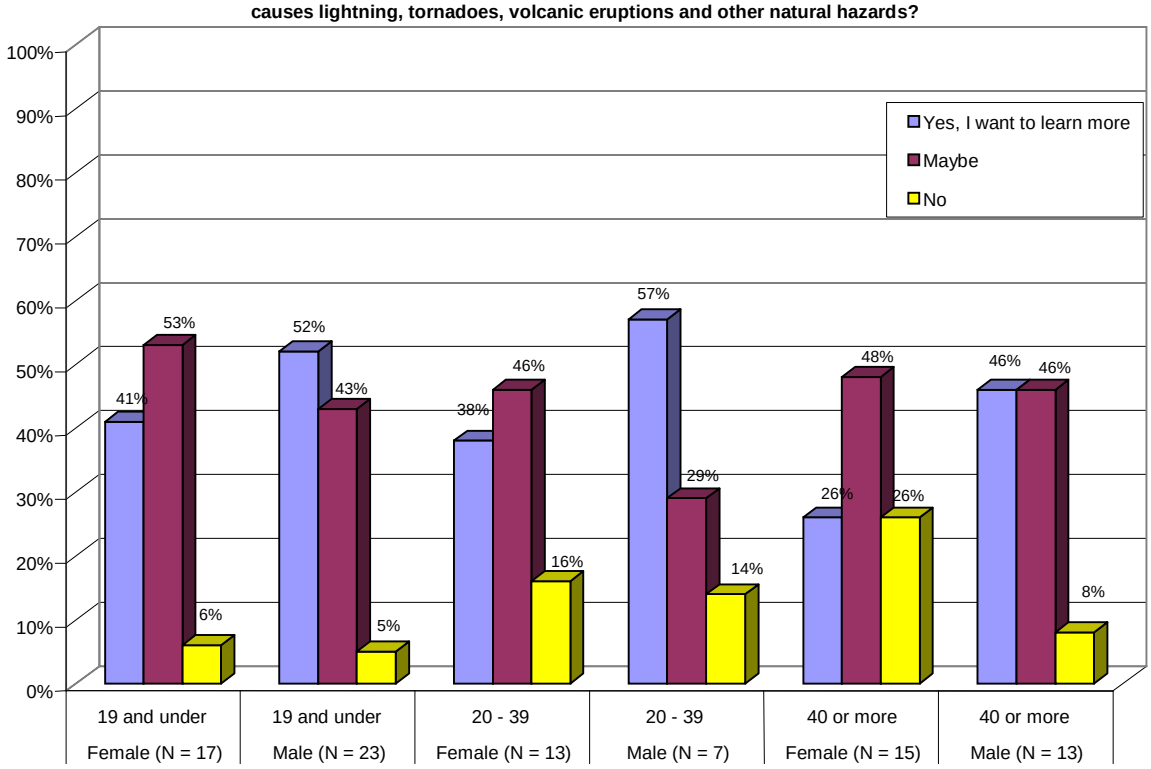
Recipe for Disaster

Figure 123. Did you learn some useful things about making a Disaster Preparedness kit?



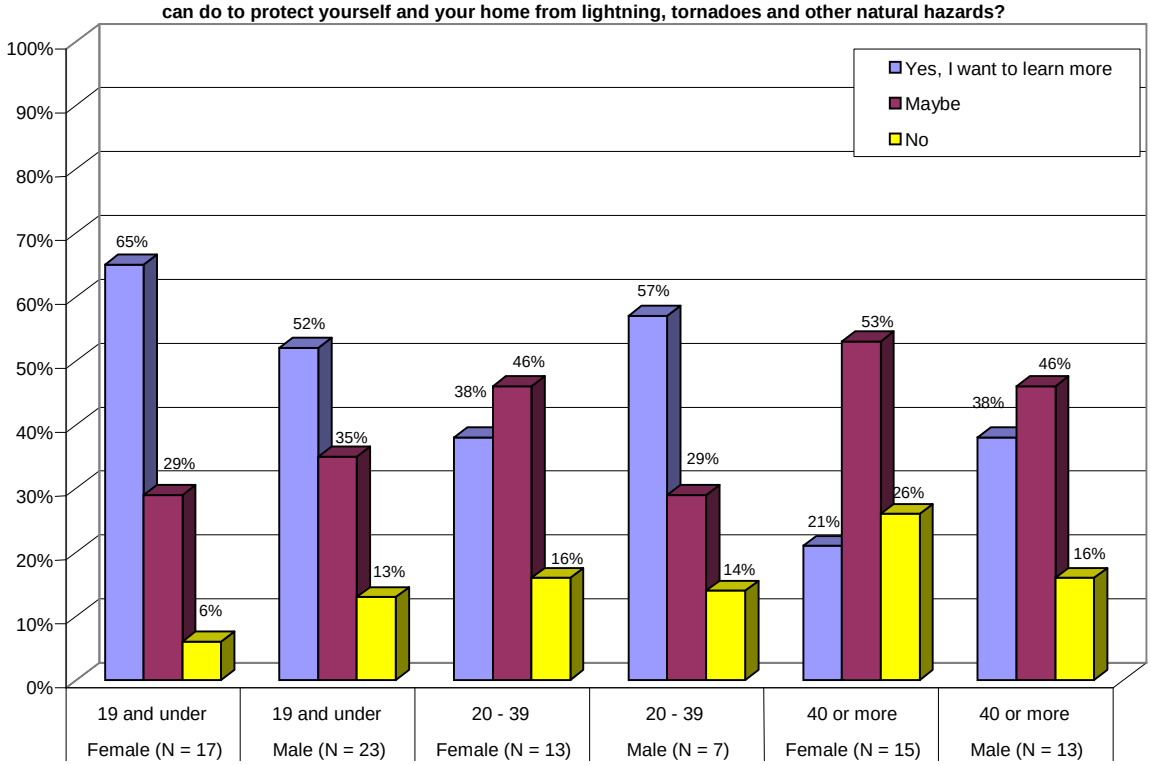
Recipe for Disaster

Figure 124. Did "Recipe for Disaster" make you want to learn more about what causes lightning, tornadoes, volcanic eruptions and other natural hazards?



Recipe for Disaster

Figure 125. Did "Recipe for Disaster" make you want to learn more about what you can do to protect yourself and your home from lightning, tornadoes and other natural hazards?



Conclusions

The conclusions below are based on all of the data reported above on the exhibits, games, displays, activities, and presentations of *Disasterville*. These data include unobtrusive observations, visitor ratings, visitor interviews, and visitors' written responses. The conclusions are organized in terms of seven major outcomes: 1) Duration of Engagement, 2) Appropriateness of Visitor Actions, 3) Understandability or Ease of Use, 4) Fun, Interest or Enjoyment, 5) Informativeness or Usefulness, 6) Increased Awareness, Appreciation or Curiosity, and 7) Desire to Learn More or Take Action.

1. Duration of Engagement

Stand-alone exhibits and displays in *Disasterville* were compared in terms of the average (mean) number of seconds that visitors were engaged with the exhibit or display (Table 54). Length of engagement varied from an average of only 23 seconds per visitor for Dare to Touch Lightning to an average of 100 seconds per visitor for Flood Table. Visitors stayed engaged with Flood Table for almost twice the amount of time that they engaged Earthquake Shake Table, which was second in terms of duration of engagement. The average (mean) across all of the stand-alone exhibits and displays was 42 seconds. The I.C.E. Plan and the Hurricane Booth were not included in this analysis (see Note at base of Table 54).

While averages reported in Table 54 might seem brief, it should be remembered that each exhibit and display in *Disasterville* is competing for the visitor's attention with all the other exhibits and displays on the floor. Some visitors were observed being distracted from an exhibit by the noise attending a neighboring exhibit. Some were also observed being pulled away from one exhibit toward another exhibit by family or friends. In addition, the design and function of some of the more structured exhibits, like Dare to Touch Lightning, mitigates against a long involvement; the exhibits' functions, once experienced by the visitor, can be repeated but not

modified. Exhibits such as Earthquake Shake Table or Three Little Pigs are less structured and allow for involvement that is limited only by the visitor's own interest and imagination.

The duration of visitors' engagement with the exhibits and displays showed few differences related to either age or gender. On Dare to Touch Lightning, visitors 20 to 39 tended to linger with the exhibit a bit longer than younger or older visitors; and on the Fortification kiosks visitors 19 and under tended to spend less time with the exhibit than the adults. Other than these two instances, no major age or gender patterns were discernable.

Table 61

Comparison of *Disasterville* Exhibits in Terms of Duration of Visitor Engagement

Exhibit	**N**	**Average (Mean) No. of Seconds Visitors Engaged in Exhibit**
Flood Table	**80**	**100 sec.**
Earthquake Shake Table	**91**	**52 sec.**
L.I.D.A.R.	**91**	**52 sec.**
Three Little Pigs	**101**	**50 sec.**
Hurricane Game/Flash Information	**109**	**47 sec.**
Dare to Enter Forest	**75**	**43 sec.**
Fire-Safe House	**98**	**31 sec.**
Tornado Video Wall	**100**	**31 sec.**
Eight Fortification Kiosks	**152**	**30 sec.***
Earthquake Jump	**127**	**24 sec.**
Hurricane Hunter	**88**	**24 sec.**
Dare to Touch Lightning	**75**	**23 sec.**
Average (Mean) Across Exhibits		**42 sec.**

*Average across the eight kiosks

Note: I.C.E. Plan is not included in the comparison table because visitors who were observed on this exhibit were specifically invited to attend to it. Hurricane Booth is not included because the nature of the exhibit did not allow for variations in duration of visitor engagement.

2. Appropriateness of Visitor Actions

Visitors interacting with a particular *Disasterville* exhibit or display were recorded as falling into one of three categories: 1) Those engaging the exhibit appropriately, indicating that they understand the exhibit and its correct operation, 2) Those engaging the exhibit inappropriately, indicating that they misunderstand the exhibit or its correct operation, and 3) Those who do not activate the exhibit but for the most part stare at the exhibit while it is not in operation. As shown in Table 55, the exhibits and displays differed considerably in terms of the percentage of visitors observed to be appropriately engaged, inappropriately engaged, and unengaged. The percentage of visitors interacting appropriately with an exhibit or display ranged from a high of 100% to a low of 51%. The average (mean) percentage was a very respectable 82%. The I.C.E. Plan, Hurricane Booth and Hurricane Hunter were not included in this analysis (see Note at base of Table 55).

Flood Table was unusual in that 100% of its visitors were observed appropriately engaged with the exhibit; none were seen to be engaged in inappropriate actions or to be disengaged. Fire-Safe House and Dare to Enter the Forest, as well as Earthquake Shake Table and Three Little Pigs, also had high percentages of visitors appropriately engaged.

Unique among all of the exhibits was Hurricane Booth. Visitor interactions with this exhibit were structured by the design of the exhibit such that it would have been difficult not to engage the exhibit appropriately. All visitors to Hurricane Booth were observed appropriately engaging the exhibit.

By contrast, almost half of the visitors to the L.I.D.A.R. exhibit and the Hurricane Game/Flash Information kiosk were observed to be interacting inappropriately or to be unengaged. L.I.D.A.R. and the Fortification kiosks had the highest percentage of visitors observed to be interacting inappropriately (37% and 22%, respectively). The exhibits with the highest percentage of unengaged visitors were Earthquake Jump (34%), Hurricane Game/Flash

Information (34%), and Tornado Video Wall (20%). Inappropriate interaction or the lack of interaction (being unengaged) often appeared to derive from a lack of understanding on the part of the visitor as to the purpose or function of the exhibit. This seemed to be the case with L.I.D.A.R., Earthquake Jump, and Hurricane Game/Flash Information. For some exhibits, these behaviors may have derived in part from a lack of interest or from boredom. For example, a number of the younger visitors, when engaging the Fortification kiosks, were observed jumping rapidly from screen to screen without any attempt to read or examine the content of the screens.

On several of the exhibits and displays, response differences by age were discernable. On Tornado Video Wall and Earthquake Jump, visitors age 40 or more were more likely to simply stand and observe an otherwise unengaged exhibit, as compared to visitors who were younger. On Hurricane Game/Flash Information, visitors 20 to 39 were more likely to engage the kiosk appropriately than those who were younger or older. On Fire-Safe House, visitors 19 and under were less likely to go through the full removal sequence that the game requires, as compared to adults. Visitors 19 and under were also much less likely to engage both sides of Flood Table, as compared to adults. Finally, on the Fortification displays, visitors 19 and under were much more likely to jump quickly from screen to screen without reading the content. Unlike the situation with age, no major differences in visitor action on the exhibits or displays were discernible between females and males.

Table 62

Comparison of *Disasterville* Exhibits in Terms of Visitor Actions

Exhibit	N	% Engaging Appropriately*	% Engaging Inappropriately**	% Unengaged***
Flood Table	80	100	0	0
Fire-Safe House	98	98	0	2
Dare Enter Forest	75	92	8	0
Earthquake Shake	91	92	8	0
Three Little Pigs	101	89	9	2
Dare to Touch Lightning	75	79	15	6
Tornado Video Wall	100	78	2	20
Fortification Kiosks	152	73	22	5
Earthquake Jump	127	66	0	34
Hurricane Game/Flash Information	109	52	14	34
L.I.D.A.R.	90	51	37	12
Average (Mean) Across Exhibits		82	10	8

*Visitor interacts with exhibit in such manner as to suggest he or she understands the exhibit and its correct operation.

**Visitor interacts with exhibit in such manner as to suggest he or she misunderstands the exhibit or its correct operation (e.g., for touch screen displays like Fortification or Dare to Enter the Forest--jumps quickly from screen to screen w/o any attempt to read or examine; for Dare to Touch Lightning--places hand in metal glove w/o activating electric current or activates electric current w/o placing hand in glove; for L.I.D.A.R.-- plays with joystick w/o pressing storm surge buttons or observing either video monitor; for Three Little Pigs and Earthquake Shake Table--assembles blocks w/o activating wind or vibrating mechanism, or activates wind or vibrating mechanism w/o assembling blocks).

***While exhibit or display is otherwise unengaged, visitor pauses to stare w/o activating the exhibit or display (e.g., stares at Earthquake Jump seismic monitor and red target on floor and walks away; looks at L.I.D.A.R. photo map and walks away; stares at introductory screen of a Fortification display and walks away; stares at Tornado Video Wall when wall is not engaged by anyone and walks away; plays with up, down, left, right panning button of Hurricane Game/Flash Information kiosk and walks away).

Note: I.C.E. Plan is not included in the comparison table because visitors who were observed on this exhibit were specifically invited to attend to it. Hurricane Booth is not included because the nature of the exhibit did not allow for variations in visitor response. Hurricane Hunter is not included because it wasn't possible to observe visitors' actions once they had entered the darkened interior of the exhibit.

3. Understandability or Ease of Use

Most of the *Disasterville* exhibits and displays got high marks from visitors for their understandability or ease of use. When asked whether an exhibit or display was easy to use or easy to understand and operate, visitors typically responded in an overwhelmingly affirmative manner. This was especially the case for such exhibits as Tornado Video Wall, Three Little Pigs, Earthquake Shake Table, Flood Table, and the Fortification kiosks. Similarly, the audience at the stage demonstration "Recipe for Disaster" agreed overwhelmingly that the presentation was easy to understand. The great majority of participants in WeatherQuest, all of whom were performing roles within a complex simulation of a modern television weather center, reported no problems in working together with other students who were playing different roles, and indicated that learning their roles was "very easy" or "fairly easy".

Again, Hurricane Booth was unique among all of the exhibits. The design and shape of the exhibit, together with video loops showing earlier visitors interacting with the exhibit, was such that all visitors approaching Hurricane Booth appeared to understand how to interact with it.

The only exhibits that appeared to have a problem with respect to understandability were L.I.D.A.R., Earthquake Jump, Hurricane Game/Flash Information, and Dare to Touch Lightning. This is apparent not only from the responses of those interviewed after experiencing each exhibit, but also from the relatively high percentage of visitors whose interactions with the exhibit appeared inappropriate (L.I.D.A.R. and Dare to Touch Lightning), or whose approach to the exhibit was to just stand and stare at it (Earthquake Jump) or to otherwise fail to interact with it (Hurricane Game/Flash Information).

Visitors' ability to understand and operate most of the exhibits had little to do with the visitors' age or gender. The three exceptions to this rule concerned L.I.D.A.R., Hurricane Game/Flash Information, and Dare to Touch Lightning. Visitors age 40 or more, as compared to

younger visitors, were more likely to express difficulty in understanding and operating L.I.D.A.R. Visitors age 40 or more were also less likely to characterize the Hurricane Game/Flash Information kiosk as easy to use compared to younger visitors. Female visitors regardless of age, tended to express more difficulty in understanding and operating Dare to Touch Lightning, as compared to male visitors.

4. Fun, Interest or Enjoyment

To investigate the question of enjoyment, visitors to the exhibits and displays of *Disasterville* and participants in WeatherQuest and "Recipe for Disaster" were asked whether they found their experience fun, interesting or exciting, or whether an exhibit or display appealed to them. These questions almost always drew an affirmative response from the majority of those interviewed. Notable among the exhibits for a high percentage of affirmative responses was Earthquake Shake Table, Hurricane Booth, Dare to Touch Lightning, and Three Little Pigs. Notable among the touch screen displays for a high percentage of affirmative responses were the Fortification kiosks. Both WeatherQuest and "Recipe for Disaster" also earned very high marks from participants.

As a general rule, the younger visitors tended to express higher levels of enjoyment than older visitors. The response to Flood Table is an example of this; interviewees 19 and under generally found the exhibit fun, but many of the young adults and older adults were less enthusiastic. However, no difference in response across age groupings was discernable for "Recipe for Disaster", Dare to Enter the Forest, Tornado Video Wall, or the Fortification kiosks. WeatherQuest was also characterized as fun by both the younger students who participated in it and the older students. The I.C.E. Plan was the only exhibit or display that tended to draw its strongest appeal from older adults.

The most problematic exhibit from the standpoint of inducing visitor responses of enjoyment was Hurricane Hunter. This exhibit was not seen as particularly appealing to visitors of any age group. Many noted that the exhibit needed to be more interactive or more realistic.

5. Informativeness or Usefulness

When gathering reactions from visitors about most of the exhibits and displays of *Disasterville* and about "Recipe for Disaster", the evaluators inquired as to whether visitors found the experience to be informative, whether they found the information useful, or whether they learned some useful things. All of these exhibits and experiences scored rather well with visitors from the standpoint of being considered informative or providing useful information. Particularly well rated in this regard were the I.C.E. Plan, the Fortification kiosks, L.I.D.A.R. and "Recipe for Disaster". On four of the exhibits (Earthquake Shake Table, Three Little Pigs, Flood Table and L.I.D.A.R.) visitors were also asked what message they thought the exhibit was trying to get across. For each of these four exhibits, the visitors were virtually unanimous in showing that they had acquired the basic message of the exhibit.

Responses from visitors regarding the informational value of the exhibits and displays were fairly uniform across age groupings. However, there was a discernable age difference on Tornado Video Wall. Compared to those 19 and under, the young adults and older adults tended to be less positive in their responses, suggesting that adult interviewees were not as convinced as to the informational value of the exhibit. A notable age by gender difference appeared on two of the exhibits. On Earthquake Jump, young males were much more likely than young females to rate their experience as informative. Similarly, on L.I.D.A.R older males were much more likely than older females to rate their experience as informative.

6. Increased Awareness, Appreciation or Curiosity

On most of the exhibits and displays, and on WeatherQuest, visitors were asked whether their experience had increased their awareness, appreciation, or curiosity regarding certain natural hazards or their affects. Without exception, every such exhibit or display produced a positive response from the majority of visitors engaging the exhibit or display. Particularly strong in this regard was the I.C.E. Plan and WeatherQuest, on which virtually all participants acknowledged a much greater or somewhat greater appreciation for the importance of an emergency plan (I.C.E.) or for television as a way of communicating useful information about natural hazards (WeatherQuest). Other exhibits or displays noteworthy for increasing awareness, appreciation or curiosity were Earthquake Shake Table, Hurricane Booth, Dare to Enter the Forest, Fire-Safe House, Flood Table, and L.I.D.A.R.

The only exhibits that tended to be somewhat weak on increasing awareness, appreciation or curiosity were Tornado Video Wall and Three Little Pigs.

Only one exhibit showed a pronounced age factor in visitor responses. Earthquake Jump was more likely to raise curiosity among visitors 19 and under about how earthquakes are measured, as compared to older visitors. Also, only one exhibit showed a pronounced gender factor in visitor responses. Male visitors to Tornado Video Wall were more likely than female visitors to say that they have a better understanding of how tornadoes form because of their experience with the exhibit.

7. Desire to Learn More or Take Action

For every exhibit and display on which visitors were interviewed, the interviewees were asked if their experience made them want to learn more about the natural hazard that was the focus of the exhibit or display, or how to protect from such a natural hazard. All of the exhibits and displays were successful to varying degrees in inducing expressions of interest in learning more. Particularly strong in this regard were the following exhibits and displays: Fire-Safe

House, Dare to Enter the Forest, Hurricane Booth, Earthquake Shake Table, Dare to Touch Lightning, Tornado Video Wall, and I.C.E. Plan. On each of these exhibits and displays, a clear majority of interviewees responded positively to queries about whether their experience with the exhibit or display made them want to learn more. Even on the exhibits that were relatively weak in this regard, specifically Earthquake Jump, Flood Table and Hurricane Game/Flash Information, a majority of interviewees expressed some interest in learning more about the natural hazard or how to protect from it.

A similar question put to the participants in WeatherQuest and "Recipe for Disaster" produced results similar to those described above. A clear majority of participants in each case indicated that the activity or presentation made them want to learn more about the science behind weather forecasts (WeatherQuest) or the causes of certain natural hazards and how to protect themselves from these hazards. ("Recipe for Disaster").

Visitors who were interviewed after experiencing one of the eight Fortifications kiosks were asked if, based on what they saw in the display, they intended to reexamine their own home and surroundings in terms of reducing the risk from the natural hazard represented. A clear majority responded "definitely yes" or "probably". Similarly, visitors who were interviewed after examining the I.C.E. display were asked if, based on what they saw in the display, they intended to build an emergency plan of their own. A clear majority responded "definitely yes" or "probably".

The above results suggest strongly that the *Disasterville* exhibits and displays and the *Disasterville*-related presentations have a positive affect on visitors from the standpoint of predisposing them to seek more information about natural hazards, their affects and how to protect against them, or predisposing them to take specific actions that could be beneficial to them.

On several of the exhibits and displays, the expression of interest in learning more about the phenomena of natural hazards and their effects or taking some action tended to favor the younger respondents. Specifically, on Hurricane Booth, Earthquake Jump and Flood Table those 19 and under were the most positive in their answers. On Fire-Safe House, Dare to Touch Lightning and the I.C.E. Plan, those age 19 and under and age 20 to 39 were most positive in their answers. The only reversal of this pattern occurred on the Fortification kiosks. Older adults were more likely than other respondents to say that they saw something in the fortification displays they would like to learn more about on their own. On the other hand, there were no major differences in response by gender across the various exhibits and displays.

Recommendations

Recommendations are listed for each exhibit, display, activity or demonstration examined as part of the *Disasterville* evaluation. All recommendations are based on unobtrusive observations of visitors, personal interviews with visitors, or the written reactions of visitors.

Recommendations are identified in terms of criticality. Those identified as "important" address issues that may have a significant impact on the way visitors respond or on what they take away from the experience. Those identified as "desirable" address elements that could improve visitors' response, but in a less significant way.

1. Tornado Video Wall

Important: Move the signs from the top of the three control panels to the side, where the signs may be easily seen by approaching visitors. Indicate, through added signage, that the big screen will display their chosen video from the smaller screens surrounding the composite image.

Important: Add captions to the video clips to increase the informational value of what is being viewed. For example, add the geographic location to the bottom of each video screen (Many visitors, especially the adults, wanted to know where the footage was filmed).

Desirable: Consider adding sound to some of the video clips for dramatic effect. Adding sound could also increase the informational value of the exhibit.

2. Hurricane Booth

Important: Emphasize that parents or guardians may want to accompany their children in the Booth, as the experience is quite loud. Also indicate the duration of the experience (45 seconds).

Desirable: Reduce unnecessary vibration and consequent noise of the exhibit (It tends to distract visitors who are trying to interact with nearby exhibits).

3. Hurricane Hunter

Important: Add signage that clarifies the purpose of the exhibit.

Important: Add audio that provides explanatory information about the content of the videos and about the function of such an aircraft.

Desirable: Enlarge the video monitors to better approximate airplane windows.

Desirable: Make the cockpit more realistic, with the addition of dials, knobs and switches.

Desirable: Add more light to the interior of the exhibit.

4. Three Little Pigs

Important: Provide varying sizes of blocks; consider providing larger blocks which can be more easily manipulated by younger visitors.

Important: Provide improved signage to clarify the purpose of the exhibit. Provide a schematic sign for non- readers.

Desirable: Provide building blocks that permit the creation of more recognizable structures.

5. Hurricane Game/Flash Information

Important: Move the kiosk to a different location so that visitors are not distracted by the noise from Hurricane Booth.

Important: Provide operating instructions (A number of people didn't notice or were confused by the roller ball and button at the base of the display).

Desirable: Consider a different title for "Hurricane Game" on the opening screen since the interactive material contained therein is not a game.

Desirable: Consider adding an array of titles on the opening screen to better represent the variety of distinct interactive segments (including the one game—"Aim a Hurricane Game") that the kiosk contains.

6. Earthquake Shake Table

Desirable: Provide miniature figures of people, animals and cars, so visitors can create a more realistic "home" setting**.**

Desirable: Provide building blocks that permit the creation of more recognizable structures.

Desirable: To the dial that is used to determine the degree of table vibration, add numbers to give the visitor an approximation of the Richter value of the vibration being created.

7. Earthquake Jump

Important: Add signage that clarifies the purpose of the exhibit.

Important: Place a vinyl sticker in the center of the bulls-eye on the floor that reads "JUMP HERE". When visitors jump in other locations, the movement does not register as well.

Important: Add text material that explains the significance or meaning of the seismic display on the monitor and the separate vertical scale (Visitors often asked for some indication of the Richter value of the "tremor" they were creating).

Desirable: Make the floor of the exhibit more sensitive, so that both the seismic monitor and the vertical scale respond more easily to the force of a person jumping (Many visitors, particularly the young, were unable to jump with sufficient force to do more than cause a small squiggle on the display monitor).

8. Dare to Enter the Forest

Important: When not in use, the game should automatically reset itself to the starting position. Add a timer to the program so that the game will restart/reset after 60 seconds of non-activity. Alternatively, provide visitors with a restart option (Visitors were observed having to interact with an incomplete game because a previous visitor had left the game unfinished).

Important: Adjust the exhibit to assure that the narrative is clearly visible on each screen of the game (Several visitors noted that parts of the narrative for some questions were off the edge of the screen). on the town.

9. Fire-Safe House

Important: Provide clarification concerning the operating instructions and the point of the game.

Desirable: Make the fire icons more realistic.

Desirable: Provide circumstances under which the home catches on fire, as a way of illustrating the risk of having combustible material near the home.

10. Flood Table

Desirable: On the river side of the exhibit, modify the water flow apparatus so that the initial water flow occurs in the river bed rather than far up along the sides (The water tends to flow along the upper reaches of the river valley before it flows along the river bed).

Desirable: On the river side of the exhibit, use replicas of houses that a strong water flow can physically move (The red miniature houses tend to remain immovable even in the face of direct water flow).

Desirable: On the town side of the exhibit, allow the flood to produce some observable affect

11. L.I.D.A.R.

Important: Add signage that clarifies the purpose of the exhibit and makes it less forbidding.

Important: Add text material that draws attention to the storm surge buttons and to the visual information on the two monitors.

Important: Adjust the joystick to make it more effective in maneuvering the video camera.

Desirable: Add a plaque to the side of exhibit, where it can be easily seen, giving the location where these houses etc. exist (Many local visitors want to know where their own house or neighborhood is located). It might be helpful to include a reference map of the state with this region indicated.

12. Dare to Touch Lightning

Important: Enlarge the signage that clarifies the purpose and function of the exhibit.

Important: Place a sign to reassure visitors that they will not be harmed by interacting with this exhibit, e.g. "This exhibit creates a loud, electrical charge – your hand is safe inside the glove". Girls were especially reluctant to interact with this exhibit due to apprehension of injury.

Important: Provide clarification as to the location of the button that activates the electrical charge (Visitors often were observed searching for the button).

Desirable: Consider the feasibility of relocating the activation button so that adolescent children can physically reach the button while still keeping their hand fully inserted in the metal glove.

Desirable: Buffer the noise created by the exhibit (It tends to distract visitors who are trying to interact with nearby exhibits).

13. Fortification Kiosks

Important: Check all fortification displays for overly "jumpy" screens (More than a few visitors complained that the screens on some displays would switch before they could finish reading them).

Important: Move or turn the Volcano kiosk away from the window. The glare can make the screen hard to read.

Important: Consider adding signage which explains that the eight fortification kiosks all provide information on strengthening the home against various types of natural disasters.

Important: Consider adding striped bands in varying colors to the exterior of the kiosk, to distinguish one from another via color coding. While the uniform look is understandable from a design viewpoint, from a practical viewpoint some guests did not realize each of the eight kiosks was providing different information.

Desirable: Add signage to the vertical facing of each kiosk to clarify the purpose of the fortification display (Some visitors indicated that they ignored or hesitated approaching a fortification kiosk because its purpose wasn't apparent to them).

14. I.C.E. Plan

Important: Provide a more understandable title above the I.C.E. display to help visitors identify the purpose of the display.

Desirable: Add more icons and explanatory pictures to each screen to maintain the interest of younger visitors or those with limited reading skills.

Desirable: Complete the e-mail component of the display; or alternatively, offer a printing option so that visitors could print out the list of emergency preparedness elements they selected and take the list with them.

Desirable: Examine each screen to determine if the verbal load of the test can be reduced (Several visitors considered it to be heavy reading, particularly for the young)

15. WeatherQuest

Desirable: Continue the practice of allowing participants to assume different roles during the simulated activity. This practice appears to add to the interest and understanding of the participants.

Desirable: Add an instant photography component, where visitors can take home a print of themselves assuming the different roles. This could be easily accomplished with Polaroid cameras used by the supervising MOSI staff member. These "take-home" photos could then provide the stimulus for additional learning and discussion in the home, or at school. These visitor photos would also provide visual documentation of learning activities for grant evaluation and promotion.

16. "Recipe for Disaster"

Important: Integrate the content of "Recipe for Disaster" more closely with the natural hazards represented in Disasterville. Consider alternating the current demonstrations on volcanoes, tornadoes, lightning and fire with demonstrations concerning earthquakes, hurricanes, hail, flood and wildfire (Fire is currently included, but not wildfire).

APPENDICES

Obsr Initials: ___ Tornado Video Wall Observation Form Date: _____

Observation

Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Pushes Buttons to Activate Video Wall & Observes Results	Y / N	Y / N	Y / N	Y / N
Pushes Buttons But Does Not Observe Results	Y / N	Y / N	Y / N	Y / N
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of En-Gagem't (in secs.)	____	____	____	____
Comments (check all that apply):				
Distracted while at exhibit	____	____	____	____
Pulled away by others	____	____	____	____
Appears confused by exhibit	____	____	____	____
If **child**, assisted by adult	____	____	____	____

Obsr Initials: ___ Tornado Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Tornado display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Has your neighborhood ever been threatened by a **tornado**? ☐Yes ☐No

2. Did you find the **Tornado** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Tornado** display that you might want to **learn more about on your own**? ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **tornadoes**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Hurricane Booth
Observation Form

Date: _____ Observer Initials: _____

Visitor Description	Observation 1	2	3	4	5
Visitor in Booth	1 / 2	1 / 2	1 / 2	1 / 2	1 / 2
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __	__ / __	__ / __	__ / __	__ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N	Y / N
Top Recorded Wind Speed	____	____	____	____	____

Comments (check all that apply):

People taking pictures of participants	____	____	____	____	____
Participants waving to those outside	____	____	____	____	____
Participants smiling	____	____	____	____	____
Participants grimacing	____	____	____	____	____
People wait-ing in line	____	____	____	____	____

Obsr Initials: ___ Hurricane Booth Reaction Form Date: _____

Would you mind answering a few questions about the Hurricane Booth you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever experienced a hurricane first hand? ☐Yes ☐No

2. Were you a little **nervous** just before entering the booth? ☐Yes ☐No

   Were you **nervous** while inside? ☐Yes ☐No

3. Did you find the experience:

   Exciting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Stimulating? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

4. Were you **surprised** by the **amount of force** exerted by 75 mph winds?

   ☐Very surprised ☐Fairly surprised ☐Only somewhat surprised ☐Not at all

5. Was there anything about the experience that **you didn't expect**?

6. Based on this experience, do you have a **greater appreciation** for the potentially destructive force of a **hurricane**?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. Does this experience make you want to **learn more about how to protect yourself** in the event of a **hurricane**?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Hurricane Hunter Observation Form Date: _____

	Observation			
Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Enters Exhibit **or**	Y / N	Y / N	Y / N	Y / N
Peeps in but Does Not Enter Exhibit **or**	Y / N	Y / N	Y / N	Y / N
Only Observes the Outside of Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	_____	_____
Comments (check all that apply):				
Distracted or pulled away by others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Did this exhibit **appeal** to you? **Yes** **Somewhat** **No**

If **yes**, what was **most** appealing? If **no**, what **wasn't** appealing?

*What changes would make this exhibit more **interesting** or **informative?***

Obsr Initials: ___ Three Little Pigs Observation Form Date: _____

Visitor Description	**1**	**2**	**3**	**4**
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Places Blocks in Path of Wind/Activates Wind/Observes Result	Y / N	Y / N	Y / N	Y / N
Assembles Blocks/Fails to Activate Wind	Y / N	Y / N	Y / N	Y / N
Moves Blocks About w/o Clear Purpose	Y / N	Y / N	Y / N	Y / N
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	____	____	____	____
Comments (check all that apply):				
Distracted while at exhibit	____	____	____	____
Pulled away by others	____	____	____	____
Appears confused by exhibit	____	____	____	____
If **child**, assisted by adult	____	____	____	____

Obsr Initials: ___ Three Little Pigs Reaction Form Date: _____

Would you mind answering a few questions about the Three Little Pigs exhibit you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever been in a hurricane or other strong wind? ☐Yes ☐No

2. Did you find this exhibit **easy to understand and operate**? ☐Yes ☐No

   If **no**, what was the problem?

3. Did you find this exhibit **fun**?

   ☐Very ☐Mostly ☐Only somewhat ☐Not at all

4. What **message** do you think this exhibit is trying to get across?

5. Does this exhibit make you **curious** about how strong winds can affect buildings and other structures?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

6. Does this experience make you want to **learn more about** how to protect againt strong winds?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. What changes, if any, would make the exhibit more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Hurricane Game/Flash Observation Form Date: _____

	Observation 1 / 2 / 3	1 / 2 / 3
Visitor Description		
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N
Visitor Action		
(1) Engages Both the Hurr. & Flash Infor. Interactives, Reading for 40+ Secs.	Y / N	Y / N
or		
(2) Engages One Interactive Segment Only, Reading for 40+ Secs.	Y / N	Y / N
or		
(3) Jumps Quickly from Screen to Screen in Either or Both Segments, With Little Effort to Read	Y / N	Y / N
or		
(4) Observes Only, or Engages Animated Pan, but Fails to Activate Screens	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____
Comments (check all that apply):		
Distracted, or pulled away by others	_____	_____
If **child**, assisted by adult	_____	_____

For **visitor action** classified as (1) or (2), interview with full reaction form.

For **visitor action** classified as (3) or (4), ask:

Did this exhibit **appeal** to you? * Did this exhibit **appeal** to you?

__Yes __Somewhat __No * ***__Yes __Somewhat __No***

If Yes, why? If No, why not? * **If Yes, why? If No, why not?**

*

*

Obsr Initials: ___ Hurricane Game/Flash Information Kiosk Date: _____
Reaction Form

Would you mind answering a few questions about the Hurricane kiosk you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Which **interactive segment** did you examine? ☐Hurricane Game
   ☐Flash Information

2. Did you find the interactive segment(s) **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics** and **pictures easy to understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information**:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Did you learn some **useful things** about **how to protect your home** from a hurricane?
   ☐Lots of useful things ☐A few useful things ☐No, not much

6. Did you see anything related to **hurricanes** or **hurricane preparation** that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **hurricanes?**

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Earthquake Shake Table Observation Form Date: _____

Visitor Description	Observation 1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Assembles Blocks/ Activates Table/ Observes Results	Y / N	Y / N	Y / N	Y / N
or				
Assembles Blocks/ But Does Not Activate Table	Y / N	Y / N	Y / N	Y / N
or				
Activates Table w/o Assembling Blocks	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	____	_____
Comments (check all that apply):				
Distracted while at exhibit	_____	_____	_____	_____
Pulled away by Others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Obsr Initials: ___ Earthquake Shake Table Reaction Form Date: _____

Would you mind answering a few questions about the Earthquake exhibit you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live in an active earthquake zone? ☐Yes ☐No

2. Did you find this exhibit **easy to understand and operate**? ☐Yes ☐No

   If **no**, what was the problem?

4. Did you find this exhibit **fun**?

   ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. What **message** do you think this exhibit is trying to get across?

6. Does this exhibit make you **curious** about how earthquakes affect buildings and other structures?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. Does this experience make you want to **learn more about** earthquakes?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

8. What changes, if any, would make this exhibit more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Earthquake Jump Observation Form

Obsr Initials: ___ Date: _____

Visitor Description	Observation 1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Activates Exhibit By Jumping/ Observes Result	Y / N	Y / N	Y / N	Y / N
or				
Attempts, but Unable to Activate Exhibit Fully	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	_____	_____
Comments (check all that apply):				
Distracted while at exhibit	_____	_____	_____	_____
Pulled away by Others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Obsr Initials: ___ Earthquake Jump Reaction Form Date: _____

Would you mind answering a few questions about the Earthquake exhibit you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live in an active earthquake zone? ☐Yes ☐No

2. Did you find this exhibit **easy to understand and operate**? ☐Yes ☐No

   If **no**, what was the problem?

3. Did you find the Earthquake exhibit:

   Fun? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Informative? ☐Very ☐ Mostly ☐Only somewhat ☐Not at all

4. Does this exhibit make you **curious** about how earthquakes are measured?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

5. Does this experience make you want to **learn more about** earthquakes?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

6. What changes, if any, would make the Earthquake exhibit more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Dare to Enter the Forest Observation Form Date: _____

	Observation			
Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Completes Entire Game, Taking Time to Read Results of Responses	Y/ N	Y / N	Y / N	Y / N
or				
Completes Part of Game While Reading Results of Responses	Y / N	Y / N	Y / N	Y / N
or				
Jumps Quickly from Screen to Screen	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Screen	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	_____	_____
Comments (check all that apply):				
Distracted, or pulled away by others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Obsr Initials: ___ Dare to Enter the Forest Reaction Form Date: _____

Would you mind answering a few questions about the Wildfire game you were just playing? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live in or near a heavily wooded area? ☐Yes ☐No

****

2. Was the wildfire game **fun**?

   ☐Very ☐Mostly ☐Only somewhat ☐Not at all

3. How **easy or difficult** was the game?

   ☐It was too easy ☐It was about right ☐It was too hard

4. Did you learn some **useful things** about wildfire?

   ☐Lots of useful things ☐A few useful things ☐Nothing much

5. Did the game make you want **to learn more** about the **causes and affects** of wildfire?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

6. Did the game increase your **awareness** of the importance of **preventing** wildfires?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. Did the game make you want to **learn more** about **what you can do to protect your home and surroundings** from wildfire?

   ☐Definitely yes ☐Yes, more or less
   ☐Only somewhat ☐No, not really

8. What changes, if any, would make the wildfire game more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Fire-Safe House Observation Form Date: _____

	Observation			
Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Completes Entire Removal Sequence, Moving from L to R	Y / N	Y / N	Y / N	Y / N
or				
Completes Part of Removal Sequence	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Screen	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	_____	_____
Comments (check all that apply):				
Distracted, or pulled away by others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Obsr Initials: ___ Fire-Safe House Reaction Form Date: _____

Would you mind answering a few questions about the game you were just playing? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live in or near a heavily wooded area? ☐Yes ☐No

****

2. Was the game **fun**?

   ☐Very ☐Mostly ☐Only somewhat ☐Not at all

3. Did the game make you want **to learn more** about the **causes** of wildfire?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

4. Did the game increase your **awareness** of the importance of **preventing** wildfires?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

5. Did the game make you want to **learn more** about **what you can do to protect your home and surroundings** from wildfire?

   ☐Definitely yes ☐Yes, more or less
   ☐Only somewhat ☐No, not really

6. What changes, if any, would make the game more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Flood Table Observation Form Date: _____

Observation

Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N

Visitor Action

Fully Engages Both Sides of Exhibit & Observes Results	Y / N	Y / N	Y / N	Y / N
or				
Engages River Side of Exhibit Only	Y / N	Y / N	Y / N	Y / N
or				
Engages Town Side of Exhibit Only	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of En-Gagem't (in secs.)	____	____	____	____

Comments (check all that apply):

Distracted while at exhibit	____	____	____	____
Pulled away by others	____	____	____	____
Appears confused by exhibit	____	____	____	____
If **child**, assisted by adult	____	____	____	____

Obsr Initials: ___ Flood Table Reaction Form Date: _____

Would you mind answering a few questions about the Flood exhibit you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live near the water? ☐Yes ☐No

2. Did you find this exhibit **easy to understand and operate**? ☐Yes ☐No

   If **no**, what was the problem?

3. Did you find the exhibit:

   Fun? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Informative? ☐Very ☐ Mostly ☐Only somewhat ☐Not at all

4. What **message** do you think this exhibit is trying to get across?

5. Does this exhibit make you **curious** about how floods can affect buildings and other structures?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

6. Does this exhibit make you want to **learn more about** how to protect your home from flood?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. What changes, if any, would make the exhibit more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ L.I.D.A.R. Observation Form Date: _____

Visitor Description	Observation 1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Fully Engages Exhibit: Works Joy Stick & Storm Surge Buttons /Observes Results	Y / N	Y / N	Y / N	Y / N
or				
Works Joy Stick/ Does Not Engage Storm Surge Buttons	Y / N	Y / N	Y / N	Y / N
or				
Works Storm Surge Buttons/Does Not Engage Joy Stick	Y / N	Y / N	Y / N	Y / N
or				
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____	_____	_____
Comments (check all that apply):				
Distracted while at exhibit	_____	_____	_____	_____
Pulled away by others	_____	_____	_____	_____
Appears confused by exhibit	_____	_____	_____	_____
If **child**, assisted by adult	_____	_____	_____	_____

Obsr Initials: ___ L.I.D.A.R. Reaction Form Date: _____

Would you mind answering a few questions about the L.I.D.A.R. exhibit you just experienced? It will only take a moment.

1. Your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live near the water? ☐Yes ☐No

2. Did you find this exhibit **easy to understand and operate**? ☐Yes ☐No

   If **no**, what was the problem?

3. Did you find the exhibit:

   Fun? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Informative? ☐Very ☐ Mostly ☐Only somewhat ☐Not at all

4. What **message** do you think this exhibit is trying to get across?

5. Did this exhibit increase your **awareness** of the problem of storm surge from hurricanes ?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

6. Does this exhibit make you want to **learn more about** storm surge and its affects?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

7. What changes, if any, would make the exhibit more **enjoyable** or more **informative**?

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Dare to Touch Lightning Observation Form Date: _____

Observation

Visitor Description	1	2	3	4
Visitor	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N	Y / N	Y / N
Visitor Action				
Places Hand in Slot/Exhibit Activated	Y / N	Y / N	Y / N	Y / N
Places Hand in Slot/Exhibit Not Activated	Y / N	Y / N	Y / N	Y / N
Activates Exhibit w/o Placing Hand in Slot	Y / N	Y / N	Y / N	Y / N
Observes but Does Not Engage Exhibit	Y / N	Y / N	Y / N	Y / N
Duration of Engagem't (in secs.)	____	____	____	____
Comments (check all that apply):				
Distracted while at exhibit	____	____	____	____
Pulled away by others	____	____	____	____
Appears confused by exhibit	____	____	____	____
If **child**, assisted by adult	____	____	____	____

Obsr Initials: ___ Dare to Touch Lightning Reaction Form Date: _____

Would you mind answering a few questions about the Dare to Touch Lightning exhibit you just experienced? It will only take a moment.

1. **Your age?** ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever been frightened by a close bolt of **lightning**? ☐Yes ☐No

2. How easy was it to figure out **what to do with this exhibit?**

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were you a little **nervous** about putting your hand in the slot? ☐Yes ☐ No

   Were you a little **nervous** while your hand was inside? ☐Yes ☐ No

4. Did you find the experience:

   Exciting? ☐Very ☐Mostly ☐ Only somewhat ☐ Not at all

   Stimulating? ☐Very ☐Mostly ☐ Only somewhat ☐Not at all

5. Was there anything about the experience that **you didn't expect**?

6. Does this experience make you want to **learn more** about **lightning** and **how it works**?

   ☐Definitely yes ☐Yes, more or less ☐Only somewhat ☐Not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Date: _____ **Observation**

Name of Fortification: _____ _____

	1 / 2 / 3	1 / 2 / 3
Visitor Description		
Gender (M or F) and Approx. Age <13 13-19 20-39 40+	__ / __ / __	__ / __ / __
Adult/Child Combo?	Y / N	Y / N
Visitor Action		
(1) Engages All or Most Display Screens, Reading/Examining for 40+ secs.	Y / N	Y / N
or		
(2) Engages Most Display Screens, But Spends <30 Secs. at Kiosk	Y / N	Y / N
or		
(3) Jumps Quickly from Screen to Screen, With Little Effort to Read	Y / N	Y / N
or		
(4) Observes Kiosk, but Does Not Activate Any Screens	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____
Comments (check all that apply):		
Distracted, or pulled away by others	_____	_____
If **child**, assisted by adult	_____	_____

For **visitor action** classified as (1), interview with full reaction form.

For **visitor action** classified as (2), (3) or (4), ask:

	*	
Did this exhibit **appeal** to you?	*	Did this exhibit **appeal** to you?
	*	
__Yes __Somewhat __No	*	***__Yes __Somewhat __No***
	*	
If Yes, why? If No, why not?	*	**If Yes, why? If No, why not?**
	*	

Obsr Initials: ___ Tornado Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Tornado display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Has your neighborhood ever been threatened by a **tornado**? ☐Yes ☐No

2. Did you find the **Tornado** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Tornado** display that you might want to **learn more about on your own**? ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **tornadoes**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Hail Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Hail display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you or anyone in your family ever been in a **hail storm**? ☐Yes ☐No

2. Did you find the **Hail** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Hail** display that you might want to **learn more about on your own**? ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **hail**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Earthquake Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Earthquake display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

2. Do you or any of your family live in an active earthquake zone ?
   ☐Yes ☐No

3. Did you find the **Earthquake** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

5. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

6. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

7. Did you see anything in the **Earthquake** display that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

8. Based on what you saw in the display, do you have a better understanding of **how to protect yourself** in the event of an **earthquake**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Volcano Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Volcano display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you or any of your family live near a **volcano**? ☐Yes ☐No

2. Did you find the **Volcano** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**? ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Volcano** display that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you have a better understanding of **how to protect yourself** in the event of a **volcanic eruption**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials___ Hurricane Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Hurricane display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever experienced a hurricane? ☐Yes ☐No

2. Did you find the **Hurricane** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Hurricane** display that you might want to **learn more about on your own**? ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **hurricanes?**

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Wildfire Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Wildfire display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

2. Has your home or neighborhood ever been threatened by **wildfire**?
   ☐Yes ☐No

3. Did you find the **Wildlife** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

5. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

6. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

7. Did you see anything in the **Wildfire** display that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

8. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **fire**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Lightning Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Lightning display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever been frightened by a close bolt of **lightning**? ☐Yes ☐No

2. Did you find the **Lightning** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful** to have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Lightning** display that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **lightning**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Flood Fortification Reaction Form Date: _____

Would you mind answering a few questions about the Flood display you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Do you live near water? ☐Yes ☐No

2. Did you find the **Flood** display **easy to use**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Were the **graphics easy to read and understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

4. Did you find the **information** in the display:

   Interesting? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

   Useful? ☐Very ☐Mostly ☐Only somewhat ☐Not at all

5. Was it **useful to** have a section on **how kids can help**?
   ☐Yes ☐Not sure ☐No

6. Did you see anything in the **Flood** display that you might want to **learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

7. Based on what you saw in the display, do you intend to **reexamine your own home and surroundings** in terms of reducing the risk from **flood**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ I.C.E. Plan Observation Form Date: _____

	Observation 1 / 2 / 3	Observation 1 / 2 / 3
Visitor Description		
Gender (M or F) and Approx. Age	__ / __ / __	__ / __ / __
<13		
13-19	__ / __ / __	__ / __ / __
20-39		
40+		
Adult/Child Combo?	Y / N	Y / N
Visitor Action		
(1) Engages All or Most of 8 Display Screens, Reading for 40+ secs.	Y / N	Y / N
or		
(2) Engages Some Display Screens, But Spends <30 Secs. at Kiosk	Y / N	Y / N
or		
(3) Jumps Quickly from Screen to Screen, With Little Effort to Read	Y / N	Y / N
or		
(4) Observes Kiosk, but Does Not Activate Any Screens	Y / N	Y / N
Duration of Engagem't (in secs.)	_____	_____
Comments (check all that apply):		
Distracted, or pulled away by others	_____	_____
If **child**, assisted by adult	_____	_____

For **visitor action** classified as (1), interview with full reaction form.

For **visitor action** classified as (2), (3) or (4), ask:

Did this exhibit **appeal** to you?

__Yes __Somewhat __No

If Yes, why? If No, why not?

Did this exhibit **appeal** to you?

__Yes __Somewhat __No

If Yes, why? If No, why not?

Obsr Initials: ___ I.C.E. Plan Reaction Form Date: _____

Would you mind answering a few questions about the In Case of Emergency Plan you were just examining? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Gender? ☐Male ☐Female

   Have you ever prepared an **emergency plan** before? ☐Yes ☐No

2. Did you find the I.C.E. information **easy to read** and **understand**?

   ☐Very easy ☐Fairly easy ☐Only somewhat easy ☐Not at all easy

3. Did the I.C.E. display give you a **greater appreciation** for the importance of an emergency plan?

   ☐Much greater appreciation
   ☐Somewhat greater appreciation
   ☐No, not really

4. Did you learn some **useful things** to include in an **emergency plan**?

   ☐Lots of useful things ☐A few useful things ☐No, not much

5. Did you see anything related to **emergency planning** that you might want **to learn more about on your own**?
   ☐Yes ☐Not sure ☐No

   If ***yes***, what might that be?

6. Based on what you saw in the I.C.E. display, do you intend to **build an emergency plan of your own**?

   ☐Definitely yes ☐Probably ☐Not sure ☐No, not really

7. What changes, if any, would make the I.C.E. display more **useful** or more **informative**?

THANK YOU FOR YOUR TIME

Bay News 9 WeatherQuest Reaction Form Date: _____

Would you mind answering a few questions about WeatherQuest? It will only take a moment.

1. **Your age**? ☐12 and under ☐13-19
   Your grade level? _____
   Gender? ☐Male ☐Female

   How **often** do you watch the weather report on TV?
   ☐Always ☐Sometimes ☐Never

---

2. Was WeatherQuest **fun**? ☐Lots of fun ☐Mostly fun ☐Not much fun

3. What **roles(s)** did you perform in WeatherQuest?

   ☐Scientist ☐Emergency Manager
   ☐Reporter ☐Producer
   ☐Director ☐Anchor Desk ☐Green Screen

4. Did you **like** the role(s) you performed?
   ☐Liked it a lot ☐Liked it some ☐Didn't like it

5. Was it **easy or hard** to learn your role(s)?
   ☐Very easy ☐Fairly easy ☐Fairly hard ☐ Very hard

6. Did you have any problems **working together** with students playing other roles?
   ☐No problems ☐A few problems ☐Lots of problems

7. What did you **enjoy most** about WeatherQuest?

8. Did WeatherQuest give you a **better understanding** of the **teamwork** needed to create televised weather reports?

   ☐Much better understanding ☐A little better understanding
   ☐No, not really

9. Did WeatherQuest give you a **greater appreciation** for television as a way of giving people useful **information** about hurricanes and other natural hazards?

   ☐Much greater appreciation ☐Somewhat greater appreciation
   ☐No, not really

10. Does WeatherQuest make you **want to learn more** about the **science** behind weather forecasts?
    ☐Want to learn lots more ☐Want to learn a little more ☐No, not really

THANK YOU FOR YOUR TIME

Obsr Initials: ___ Observation of "Recipe for Disaster" Date: _____

Number of Visitors, by Gender & Approximate Age:

	<13	13-19	20-49	50+
Male	____	____	____	____
Female	____	____	____	____

Question-Response Matrix:

Qtn	Directed to Audience (**A**) or persons invited on stage (**S**)	Response Required [TF,Y/N, or Open Response]	Nature of Demonstration
___	_____	_____	_____
___	_____	_____	_____
___	_____	_____	_____
___	_____	_____	_____
___	_____	_____	_____
___	_____	_____	_____
___	_____	_____	_____

No. of Visitors Invited On Stage (Use On-going Tally): _____

No. appearing **attentive** while on stage (focused on task at hand): _____

No. **speaking** while on stage (asking/responding to qtns, etc.): _____

No. engaging in **motor activity** (selecting, classifying, etc.): _____

No. showing signs of **having fun** on stage (smiling/laughing): _____

Comments About Audience (Check all that apply):

Young in audience appear attentive to (**__start / __middle / __end**) of presentation

Adults in audience appear attentive to (**__start / __middle / __end**) of presentation

Notes:

What Did You Think of "Recipe for Disaster"? Date: _____

We need your help to know how we are doing. Would you mind answering a few questions about the "Recipe for Disaster" presentation you just saw? It will only take a moment.

1. What is your age? ☐12 and under ☐13-19 ☐20-39 ☐40 and more

   Are you a male (boy) or a female (girl)? ☐Male ☐Female

   Have you been through MOSI's *Disasterville* on the 2nd floor? ☐Yes ☐No

****

2. Was the "Recipe for Disaster" presentation **easy to understand**? ☐Yes ☐No

   If **no**, what was the problem?

3. Was "Recipe for Disaster" **Fun?** ☐Lots of fun ☐Mostly fun ☐Not fun

4. What did you **enjoy most** about "Recipe for Disaster"?

5. Did you learn some useful things about volcanos, lightning, tornadoes or other natural hazards?

   ☐Lots of useful things ☐A few useful things ☐Nothing much

6. Did you learn some **useful things** about making a Disaster Preparedness Kit?

   ☐Lots of useful things ☐A few useful things ☐Nothing much

7. Did "Recipe for Disaster" make you **want to learn more** about **what causes** lightning, tornadoes, volcanic eruptions and other natural hazards?

   ☐Yes, I want to learn more ☐Maybe ☐No

8. Did "Recipe for Disaster" make you **want to learn more** about **what you can do to protect yourself and your home** from lightning, tornadoes and other natural hazards?

   ☐Yes, I want to learn more ☐Maybe ☐No

THANK YOU FOR YOUR TIME