

**Indoor Tot Spot**  
**Summative Evaluation**  
Prepared by Minda Borun and Rose Kelly  
April 2005

## Indoor Tot Spot Summative Evaluation

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### Introduction

This report summarizes data collected for the summative evaluation of the indoor Tot Spot.<sup>1</sup> It is based on four different data sets:

- Tracking and timing of children through the exhibit (N=26 subjects) July, August & September 2004
- Sweeps (counting the number of children at each component) (N=25 sweeps)
- Interviews with adults (N=28 subjects)
- Behavioral observations of adult/ child groups (N=34 groups)

### Tracking and Timing

Families spend a long time in Tot Spot. Average time in exhibits is generally around 15 minutes<sup>2</sup>. In Tot Spot the average time is 27 minutes, nearly half an hour. Most families visit both rooms, spending somewhat more time in the water room. They engage with an average of 9 out of the 15 components (59%) of components available.

**TABLE 1: TRACKING SUMMARY (N= 26)**

	<b>Average</b>	<b>Range</b>
Time in Exhibit	27 minutes	7 to 70 minutes
Time in Water Room	11 minutes	
Time in Forest Room	9.4 minutes	
Number of Components visited (out of 15)	8.8 (59%)	3 to 13

Visitors to:	Number	Percent
Both Rooms	21	81%
Water Room only	4	14%
Forest Room only	1	5%

<sup>1</sup> Data was collected primarily by Rose Kelly, Preliminary report prepared by Mary Kidwell.

<sup>2</sup> Based on comparative data for 8 exhibits at The Franklin Institute.

**TABLE 2: DEMOGRAPHICS TRACKING SAMPLE**

	<b>Number</b>	<b>Percent</b>
Boys	13	50
Girls	13	50
Totals	26	100

Average age of Children: 2.5 years

### **Holding Power**

The experiences at which people spend the most time are the Climbing Structure and the three Waterbeds.

**TABLE 3: TIME AT COMPONENTS**

Mean and Range of Time (seconds) Spent at Each Component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Range</b>
1	44	Climbing Structure	197.0	53 - 918
2	34	Stream Waterbed	186.9	10 - 945
3	35	Pond Waterbed	151.6	9 - 658
4	32	Lake Waterbed	128.3	13 - 496
5	42	Lizard Lounge	95.0	25 - 1032
6	31	Bubble Columns	82.9	13 - 309
7	39	Shape Shorter	60.2	40 - 396
8	33	Waterfall Tunnel	44.7	4 - 287
9	40	Burrow Bench	39.7	8 - 227
10	38	Tunnel Forest room	38.5	10 - 190
11	29	Costumes: Water Room	34.5	5 - 271
12	36	Costumes: Forest room	32.7	6 - 702
13	43	Floor Textures	17.9	3 - 187
14	37	Animal sounds: Forest Room	7.3	2 - 89
15	30	Animal Sounds: Water Room	5.9	2 - 78

**TABLE 4: STOPS AT COMPONENTS**

<b>Rank</b>	<b>Map #</b>	<b>Exhibit</b>	<b>Total Stops</b>	<b>Avg. Stops/child</b>	<b>% children interacting</b>
1	34	Stream Waterbed	80	3.08	77%
2	33	Waterfall Tunnel	75	2.88	85%
3	32	Lake Waterbed	68	2.62	92%
4	44	Climbing Structure	51	1.96	54%
5	35	Pond Waterbed	43	1.65	88%
6	31	Bubble Columns	40	1.54	85%
7	38	Tunnel Forest room	30	1.15	58%
8	42	Lizard Lounge	25	.96	50%
9	43	Floor Textures	25	.96	54%
10	29	Costumes: Water Room	20	.77	42%
11	39	Shape Shorter	18	.69	50%
12	30	Animal Sounds: Water Room	18	.69	35%
13	40	Burrow Bench	17	.65	48%
14	37	Animal sounds: Forest Room	16	.62	35%
15	36	Costumes: Forest room	9	.35	15%

Children tend to make multiple stops at components as they explore the area. The most popular components are The Waterbeds, the Waterfall Tunnel, and the Bubble Columns.

## Sweeps

While tracking and timing tells us which components people visited and how long they stayed or the relative “dwell time” or “holding power” of different components, sweeps is a count of the number of people at each component at a point in time. Sweeps give us a measure of the relative “attracting power” of the different exhibit components. There were 25 sweeps of Tot Spot totaling 799 children.

From the sweeps, again we see that the most popular elements are the three waterbeds. Also popular are the Lizard Lounge, the Bubble Columns, the Climbing Structure and the Shape Sorter.

**TABLE 5: SWEEPS<sup>3</sup>**  
Number and Percent of Visitors Observed at Each Component

Rank	Map #	Exhibit	Number	Percent
1	32	Lake Waterbed	133	16.6%
2	34	Stream Waterbed	118	14.8%
3	35	Pond Waterbed	92	11.5%
4	42	Lizard Lounge	75	9.4%
5	31	Bubble Columns	70	8.8%
6	44	Climbing Structure	67	8.4%
7	39	Shape Sorter	67	8.4%
8	33	Waterfall Tunnel	39	4.9%
9	40	Burrow Bench	36	4.5%
10	38	Tunnel Forest room	35	4.4%
11	36	Costumes: Forest room	27	3.4%
12	43	Floor Textures	21	2.6%
13	29	Costumes: Water Room	19	2.4%
14	30	Animal Sounds: Water Room	0	0.0%
15	37	Animal sounds: Forest Room	0	0.0%

<sup>3</sup> Percent for sweeps is based on total sample of 799 rather than on number of sweeps as in original data.  
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## Score

If we multiply the average holding power of each component by the percent of visitors (from the sweeps table) that stopped at the component, we get a combined measure of attracting and holding power or "score". Here the scores are consistent with the tracking and timing and the sweeps data. The three waterbeds have the highest scores. The Climbing Structure, Lizard Lounge, Bubble Columns and Shape Sorter also have fairly high scores.

**TABLE 6: SCORE**  
Mean time (seconds) x % of Visitors

Rank	Map #	Exhibit	Mean	Percent	Score
1	34	Stream Waterbed	186.9	14.8%	2760
2	32	Lake Waterbed	128.3	16.6%	2136
3	35	Pond Waterbed	151.6	11.5%	1746
4	44	Climbing Structure	197.0	8.4%	1652
5	42	Lizard Lounge	95.0	9.4%	892
6	31	Bubble Columns	82.9	8.8%	726
7	39	Shape Sorter	60.2	8.4%	505
8	33	Waterfall Tunnel	44.7	4.9%	218
9	40	Burrow Bench	39.7	4.5%	179
10	38	Tunnel Forest room	38.5	4.4%	169
11	36	Costumes: Forest room	32.7	3.4%	111
12	29	Costumes: Water Room	34.5	2.4%	82
13	43	Floor Textures	17.9	2.6%	47
14	30	Animal Sounds: Water Room	5.9	0.0%	0
15	37	Animal sounds: Forest Room	7.3	0.0%	0

## **Exit Interviews**

Interviews with 28 adults (parents and caregivers) upon leaving the exhibit area were conducted in August, 2004.

**Table 7: DEMOGRAPHIC INFORMATION ABOUT THE ADULTS INTERVIEWED**

	<b>Totals</b>	<b>Weekday</b>	<b>Weekend</b>
Interviews	28	12 (42%)	16 (57%)
Males	6	0	6 (100%)
Females	22	12 (55%)	10 (45%)
First time visitors	12	4 (33%)	8 (67%)
BADM members	16	7 (43%)	9 (56%)

**Question 1: We were just wondering how people perceive this area. There's no right or wrong answer. What would you say this area is about? (multiple answers accepted)**

**Table 8: WHAT IS AREA ABOUT?**

	<b>Number</b>	<b>Percent</b>
Thematic content	15	56%
Mentions Water Room thematic elements only	9	32%
Mentions both Water & Forest thematic elements	3	11%
Mentions Forest thematic elements only	2	7%
Play, Safety, Inside/Outside	10	36%
Discovery, Exploration, Developmental Growth	6	21%
Social Learning	2	7%
Don't know	1	4%

The most common response to this question correctly identified thematic content: water, mountains, nature or animals. Ten respondents (36%) talked about Tot Spot as a place to play, especially playing in safety, or that Tot Spot is the outdoors brought inside, making the experience clean and safe. Six respondents (21%) talked about discovery, exploration, and developmental growth. A couple of respondents talked about social learning (both parent-child and child-child).

**Question 2: Did you visit both rooms?****Table 9: SECTIONS VISITED**

	<b>Number</b>	<b>Percent</b>
Visited Both Rooms	23	82%
Water Room Only	5	18%
Forest Room Only	0	0
Total	28	100%

Twenty-three of the twenty-eight respondents (82%) said that they visited both rooms, and 5 said that they only visited the Water room. None of the respondents said that they only visited the Forest room. This is fairly consistent with both the Timing/Tracking data and the Behavioral data.

- a. **From looking at this (Water) room, what kind of place would you say it represents?**

**Table 10: NAMES WATER THEME**

	<b>Number</b>	<b>Percent</b>
Mentions water, pond, lake, etc.	28	100%
Mentions water animals	9	32%

The Water room consistently conveys a representation of a watery environment. All 28 respondents specified something relating to water when asked this question. Within this general idea, perception varies from river, marsh, lagoon, to ocean or bay.

- b. **What would you say the other (Forest) room represents? (25 respondents: multiple answers accepted)**

**Table 11: NAMES FOREST THEME**

	<b>Number</b>	<b>Percent</b>
Mentions earth, rocks, land, etc.	15	60%
Mentions climbing	8	32%
Mentions animals	6	24%
Mentions textures	4	16%
Nature	3	12%
Playroom	2	8%

Many answers center on nature, climbing, textures, or earth. The answers are far more varied than those for the Water room, ranging from bugs, jungle, rock-climbing, forest, adventure, to "a standard playroom." Several visitors mentioned uncertainty about the area's theme. One respondent pointed out "I think the forest room was too sparsely furnished."



**Question 3: Were there any areas that helped you interact with your child? If yes, which ones? (multiple answers accepted)**

**Table 12: EXHIBITS THAT HELP INTERACTION**

	Number	Percent
Waterbeds	7	25%
Waterfall Tunnel	6	21%
Bubble Columns	5	18%
Child Plays Independently	5	18%
Shape Sorter	4	14%
Tunnel in Forest Room	3	11%
Burrow Bench	2	7%
Costumes	2	7%
Floor Textures	1	4%
Climbing Structure	1	4%
All the Areas	1	4%
Everything in Water Room	1	4%

Frontrunners for this question were the Bubble Columns, Waterfall Tunnel, Waterbeds and Shape Sorter. There were also 5 responses saying either that their child plays independently, or that one of the things the parent liked about the space is that their child doesn't need any mediation.

**Question 4: Were there activities here that you think helped your child to develop or stretch their skills? If yes, which activities?**

**Table 13: EXHIBIT THAT DEVELOP SKILLS**

	Number	Percent
Climbing Structure	9	32%
Shape Sorter	8	29%
Bubble Columns	6	21%
Waterbeds	4	14%
Waterfall Tunnel	3	11%
Floor Textures	3	11%
Science Content about Animals	2	7%
All the Areas	2	7%
Everything in Water Room	2	7%
Costumes	1	4%
Tunnel in Forest Room	1	4%
Burrow Bench	1	4%
No, Nothing, Don't Know	5	18%

Parents and caregivers did perceive that the activities helped their child to develop or stretch skills. The most common answers for this question were the Climbing Structure, the Shape Sorter, and the Bubble Columns. Eight respondents (29%) made some reference to their child gaining confidence or getting braver, bolder.

**Question 5: Were there any places that you thought needed to be safer? If yes, which ones? (multiple answers accepted)**

**Table 14: SAFETY ISSUES**

	Number	Percent
No, Nothing	12	43%
Crowding Impacts Safety / Parental Responsibility	11	39%
Specific suggestions	4	14%
Big Kids and Little Kids together	2	7%

The most prevalent response to this question was “no”, nothing needed to be safer. “It’s so safe that they (the children) can be freer here than in other places.” Many respondents did mention crowding, but most also pointed out that it was their responsibility to keep a closer eye on their children when it’s crowded, or to choose to go to another area. In all, there were only 4 suggestions of things respondents felt needed to be safer.

- More padding is needed on the frame of the costume rack.
- Need more padding around tunnel.
- Dropdown in the climbing structure should be moved from being in same place as the turnaround.
- Kids can roll off the edge of the waterbed.

**Question 6: Is there anything else you would like to tell us about Tot Spot?**

Most answers were positive comments about Tot Spot or other areas at BADM. Four parents (14%) specified that they appreciated having an area for younger kids where older children are kept out.

A couple of respondents talked about components from previous versions of the space, that were missed (the “ant hill,”) or not working consistently (the Bubble Columns), and three (11%) shared negative impressions or experiences (“I don’t like the ‘pit’ (the Lizard Lounge). One comment came up several times through various questions: that the buttons for the Bubble Columns are quite difficult for very young children to work, with a suggestion that a wall push might be easier for very young children to operate.

## **Behavioral Observations**

The following section is based on observations of 34 groups in Tot Spot. Group behavior was observed and coded.

Rules used in coding (in addition to the “Tot Spot Behavioral Definitions”).

- “Using the Exhibit as Designed”: coded as “yes” if either the child or adult was observed behaving according to the exhibit description.
- “Parent/Child Talking Together” was coded only if the talk was about an exhibit.
- Wearing a costume was coded as “Using Exhibit as Designed” and “Animal Pretend Play”; Handling a costume as “Using Exhibit as Designed” only.
- “Animal Pretend Play” includes playing with puppets.
- Playing with a lily pad is coded as “Using Exhibit as Designed” for waterbed components.
- Sometimes it was not clear if speech was talking to others or self talk.
- Remarks such as “Hi” or “I see you” were not coded as “Talking about Exhibit”. This sort of remark was common for the Climbing activity.

**Table 15: VISITS TO ROOMS (N=34)**

Visitors to:	Number	Percent
Both Rooms	30	88%
Water Room only	3	9%
Forest Room only	1	3%

### Behavioral Observation Summary

The behavior of children and adults shows that the exhibits elicited frequent instances of animal pretend play, naming animals and talk about animals. In addition, there was a good deal of interaction between parents and children. Most of the time, the exhibits were used as intended and the children enjoyed them. Nearly half of the groups (47%) observed showed instances of animal pretend play, naming animals or talk about animals, indicating that the desired pre-science learning behaviors were taking place in Tot Spot.

**Table 16: BEHAVIOR IN WATER ROOM** (Number of instances of each behavior)

Compt. Number Compt. Name	29 Costumes	30 Sounds	31 Bubbles	32 Lake	33 Tunnel	34 Stream	35 Pond	Totals All
# of Grps at	15	21	27	29	28	28	22	170
Photo Op	1			2	1	1		5
Anml Pretend Play	7	10	9	6	3	4	3	42
Naming Animals	12	16	14	11	1	3	20	77
Talk About Anmls	3	1		4		1	2	11
Self-talk			1		1	2	1	5
Parent/Child Talk	12	17	26	11	5	9	26	106
Social Skills		3	1	2	3	1		10
Discipline/Conflict		1		3		4	2	10
Affect: Happy	2	11	9	13		25	9	74
Affect: Unhappy		1	2	2		5		10
Used as Designed (# of times)	12*	18	18	39	27	24	23	161

**Table 17: BEHAVIOR IN WATER ROOM** (Number and Percent of Groups showing each behavior)

Compt Number Compt Name	29 Costumes	30 Sounds	31 Bubbles	32 Lake	33 Tunnel	34 Stream	35 Pond	Totals All
# of Grps at	15	21	27	29	28	28	22	170
Photo Op	1 7%			1 3%	1 4%	1 4%		4 2%
Anml Pretend Play	6 40%	7 33%	6 22%	6 21%	2 7%	3 11%	3 14%	33 19%
Naming Animals	6 40%	9 43%	6 22%	7 24%	1 4%	2 7%	12 55%	43 25%
Talk About Anmls	2 13%	1 5%		2 7%	1 4%	2 7%		8 5%
Self-talk			1 4%		1 4%	2 7%	1 5%	5 3%
Parent/Child Talk	9 60%	11 52%	17 63%	8 28%	4 14%	6 21%	17 77%	72 42%
Social Skills		3 14%	1 4%	2 7%	3 11%	1 4%		10 6%
Discipline/Conflict		1 5%		3 10%		4 14%	2 9%	10 6%
Affect: Happy	2 13%	7 33%	9 33%	10 35%	3 11%	14 50%	8 36%	53 31%
Affect: Unhappy		1 5%	2 7%	2 7%		4 14%		9 5%
Used as Designed (#of groups)	8 53%	16 76%	14 52%	20 69%	16 57%	17 61%	17 77%	108 63%

## FOREST ROOM

As in the Water Room above, there were many instances of animal pretend play, naming animals and talk about animals and frequent parent/child interaction.

**Table 18: BEHAVIOR IN FOREST ROOM** (Number of instances of each behavior)

Compt Number Compt Name	36 Costume	37* Sounds	38 Tunnel	39 Sorter	40 Bench	42 Lizard Lounge	43 Floor Texture	44 Climb	Totals
# of Groups at	12	13	19	21	13	21	21	25	145
Photo Op						1		1	2
Anml Pretend Play	10	1	8	3	3	3	2	2	32
Naming Animals	7	9	9	2	8	10	1	6	52
Talk About Anmls	2	2	1		1	2			8
Self-talk				1	1	1			3
Parent/Child Talk	10	8	8	9	7	10	10	8	70
Social Skills			4	3	2	1	2	5	17
Discipline/ Conflict			2	3	2	2		2	11
Affect: Happy	2	2	4	6	4	6	9	16	49
Affect: Unhappy		1		2		3		2	8
Used as Designed (# of times)	13	14	15	12	10	14	26	27	131

Exhibit #41 was not available. A bench was in its place. One group was observed at the bench.

\*At least one sound button was broken during at least 5 observations.

**Table 19: BEHAVIOR IN FOREST ROOM** (Number of instances of each behavior)

Compt Number Compt Name	36 Costume	37* Sounds	38 Tunnel	39 Sorter	40 Bench	42 Lizard Lounge	43 Floor Texture	44 Climb	Totals All
# of Groups at	12	13	19	21	13	21	21	25	145
Photo Op						1 5%		1 4%	2 1%
Anml Pretend Play	7 58%	1 8%	5 26%	2 10%	3 23%	2 10%	2 10%	2 8%	24 17%
Naming Animals	6 50%	4 31%	7 37%	2 10%	3 23%	5 24%	1 5%	4 16%	32 22%
Talk About Animals	2 17%	2 15%	1 5%		1 8%	2 10%			8 6%
Self-talk				1 5%	1 8%	1 5%	1 5%		4 3%
Parent/Child Talk	8 67%	7 54%	8 42%	9 43%	2 15%	5 24%	9 43%	6 24%	54 37%
Social Skills			3 16%	3 14%	2 15%	1 5%	2 10%	4 16%	15 10%
Discipline/ Conflict			2 11%	3 14%	2 15%	2 10%		2 8%	11 8%
Affect: Happy	2 17%	2 15%	4 21%	6 29%	4 31%	5 24%	8 38%	10 40%	41 28%
Affect: Unhappy		1 8%		2 10%		3 14%		2 8%	8 6%
Used as Designed (# of Groups)	8 67%	9 69%	12 63%	9 43%	7 54%	12 57%	17 81%	19 76%	93 64%

## **Conclusions**

Families are spending a long time in Tot Spot. The average time in the exhibit is 27 minutes or nearly half an hour. This is almost twice the average time people generally spend in interactive exhibits. Most families visit both rooms, spending somewhat more time in the water room. They engage with an average of nine out of the fifteen components which is 59% of the available components.

Children tend to make multiple stops at components as they explore the area. The most popular components are The Waterbeds, the Waterfall Tunnel, and the Bubble Columns. The three waterbeds also have the highest scores. The Climbing Structure, Lizard Lounge, Bubble Columns and Shape Sorter also have high scores. The Waterbeds, Waterfall Tunnel, Bubble Columns and Shape Sorter were the exhibits that parents cited when asked which of the devices encouraged parent/child interaction. Similarly, parents cited the Climbing Structure, the Shape Sorter, and the Bubble Columns when asked which exhibits helped their child develop or stretch their skills. There is a great deal of concordance among the various measures.

On the exit interview, adults correctly identified the thematic content of the area: water, mountains, nature and animals. The Water Room was somewhat stronger in conveying a theme than is the Forest Room. Adults said that they valued Tot Spot as a safe place to play. About a quarter of the respondents mentioned Tot Spot as an area that stimulated discovery, exploration, and developmental growth. A couple of respondents talked about social learning (both parent-child and child-child).

Parents and caregivers perceive Tot Spot as a comfortable and safe place for their young children to explore and begin to learn about animals. A few adults specifically mentioned that they appreciated having an area for younger kids where older children are kept out.



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### **Introduction**

The Bay Area Discovery Museum is located within a National Park setting, which includes the historic Fort Baker and the surrounding natural area. Tot Spot is one of three new, permanent exhibition areas that feature references to the local environment, animals and their habitats. One of the goals for Tot Spot was to use native animals and their homes to engage children in developmentally appropriate play and exploration. It also was designed to serve an adult audience of parents and caregivers who, by playing with their children, could learn about their children's development. Tot Spot includes both indoor and outdoor environments that are each divided into a water-themed and a forest-themed area.

Tot Spot was created to serve a very young audience as appropriately and innovatively as possible. By capitalizing on its knowledge of this audience's needs, the Museum sought to surpass its prior success at providing excellent early childhood environments. This summative evaluation demonstrates the outcome of this endeavor.

### **Exhibit Goals**

Goals for Tot Spot were to:

- 1) provide a high quality, safe learning experience for families with children under age 4;
- 2) provide an innovative exploratory learning environment for this important and unique audience;
- 3) foster visitor understanding of and concern for the natural world;
- 4) encourage parents to learn about and facilitate their child's development

Strategies for achieving these goals included offering multiple approaches to involving visitors. Children would be able to:

- engage in dramatic play, pretending to be animals by wearing costumes or using puppets;
- use fine motor skills with animals props and manipulatives;
- practice language;
- challenge their gross motor skills by crossing a bridge, crawling through a tunnel, or climbing a "mountain."

### **Summative Evaluation**

Visitors were randomly sampled on weekdays and weekends including free afternoons at the Museum. Due to the young age of the subjects, most visitors came between 10:30 am and 1:00 pm and left prior to naptime. This report summarizes five data sets collected for the summative evaluation of the Outdoor Tot Spot.<sup>1</sup>

1. Tracking and timing of children through the exhibit. This was conducted in June and July 2005 for the Stream (N=52 subjects), and in August, September and October 2006 for the Meadow (N=49 subjects).
2. Tracking and timing of children for their entire visit, both inside and outside. October, November, and December for the entire Tot Spot (N=50).
3. Sweeps (counting the number of children at each component) (N=97 sweeps for the Stream, N=49 for the Meadow, N=50 for the entire Tot Spot).
4. Interviews with adults about their visit to outdoor Tot Spot (N=100 subjects)
5. Behavioral observations of adult/child groups (N=34 groups for the Stream, N=30 for the Meadow).

A summative evaluation for the indoor portion of Tot Spot was conducted in 2004. The final report for this exhibit, written in April of 2005, is attached as an appendix.

### **Demographics**

The average age for all children included in this project is 2.37 years. Other visitor surveys conducted by the Bay Area Discovery Museum find that the average age for the Museum's audience overall is 2.9 years. Tot Spot was specifically designed for children under 4 years as a safe and developmentally appropriate space. Unlike the rest of the Museum, there is a height limit at the entrance to Tot Spot that only allows children under 42 inches to enter. This height cap is based on the 90<sup>th</sup> percentile for 4 year olds on their 4<sup>th</sup> birthday.

**TABLE 1: DEMOGRAPHICS FOR SUMMATIVE EVALUATION STUDIES**

	Member	Non-member	Total	Average age
Behavioral Coding – Stream	N/A	N/A	14 boys 20 girls	2.38
Behavioral Coding – Meadow	9 boys 6 girls	9 boys 6 girls	15 boys 15 girls	2.75
Tracking and Timing– Stream	N/A	N/A	26 boys 26 girls	2.3
Tracking and Timing–Meadow	16 boys 21 girls	7 boys 5 girls	23 boys 26 girls	2.28
Tracking and Timing – All	17 boys 19 girls	10 boys 4 girls	27 boys 23 girls	2.15
Adult Interviews with children	51 boys 54 girls	18 boys 24 girls	69 boys 78 girls	2.37
Total (not including Stream)	93 boys 100 girls	44 boys 36 girls	362 children	2.37

<sup>1</sup> Summative evaluation of the Indoor Tot Spot was conducted earlier and is reported separately.

Adult Interviews (adults only)	13 men 55 women	12 men 20 women	25 men 75 women	
Total	13% men 55% women	12% men 20% women	100 adults	

Of the adults interviewed, forty-three percent of the families visited only the Stream Plaza, five percent only the Meadow and fifty-two percent visited both the Stream Plaza and Meadow areas of Tot Spot.

**Tracking and Timing**

The outdoor area of Tot Spot is 9,200 square feet, of which 5,812 square feet are exhibits and 3,200 square feet are landscaped. The inside portion of Tot Spot measures 1,850 square feet. There are three Timing and Tracking data sets: 1) the Stream, 2) the Meadow and 3) the entire visit (including the indoor area). The average dwell time at both the Meadow and the Stream is 12 minutes. At the Stream Plaza, children engage with an average of 3 out of the 5 exhibit components, (60%) of components available. For purposes of this survey, information on the three sub-areas of the Stream Plaza was also collected: 1) the Waterfall, 2) the Length of the Stream and 3) the End of the Stream. Children spent an average of 8.3 minutes (69% of their time) at the Stream. At the Meadow, children visited an average of 5 out of 13 components (38%).

Fifty visitors were also observed during their entire visit to Tot Spot, including indoor as well as outdoor areas. Some (20%) visitors went inside only, some (24%) outside only while over half (56%) visited both areas. These visits averaged 33 minutes and the visitors interacted with 9 out of 28 components (32%). Note that this is less than Serrell’s standard of 51%<sup>2</sup>. It is probably a function of the extreme youth of the visitors, who tend to focus on a few items rather than surveying an entire exhibition.

**TABLE 2: TRACKING SUMMARY**

	<b>Average</b>	<b>Range</b>
Time at Stream (N=52)	12 minutes	2 to 40 minutes
Number of Components at Stream	3 of 5 (60%)	1 to 7
Time at Meadow (N=49)	12 minutes	3 to 36 minutes
Number of Components at Meadow	5 of 13 (38%)	1 to 10
Time for Entire Visit (N=50)	33 minutes	6 minutes to 1 hour 37 minutes
Number of Components all of Tot Spot	9 of 28 (32%)	1 to 20

<sup>2</sup> Serrell, Beverly (1998). *Paying Attention: Visitors and Museum Exhibitions*, American Association of Museums, Washington DC.

### **Holding Power**

The experiences at which people spent the most time are the Stream Plaza, the Puppet Theater, and Gopher Tunnel in the Meadow. These components seem to satisfy specific developmental needs for children. At the Stream, children spend a long time playing with the fish in the water, using their fine motor skills. The Puppet Theater is very social with children and adults alternating between being the audience and the performer. Children run up and down the slope of the Gopher Tunnel, honing their gross motor skills, usually with a group of other children.

Interestingly, when visitors are observed for their entire visit at Tot Spot, the Stream has the greatest holding power but the next six longest dwell times are for components inside of Tot Spot. Weather plays a role in this behavior, as does the proportion of very young children, many of whom are not yet walking and are kept inside by parents and caregivers.

**TABLE 3A: TIME AT COMPONENTS - STREAM**

Mean and Range of Time (seconds) Spent at Each Component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Range</b>
1	3, 4, 5	All 3 parts of Stream	500.00	3-1121
	4	Length of Stream	422.02	56-1121
	5	End of Stream	40.27	5-710
	3	Waterfall	37.71	3-296
2	7	Bridge	35.00	5-439
3	6	Climb-on Turtle	11.83	5-153
4	2	Animal Graphic	1.58	3-54
5	1	Animal Tracks	.58	5-25

**TABLE 3B: TIME AT COMPONENTS - MEADOW**

Mean and Range of Time (seconds) Spent at Each Component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Range</b>
1	12	Puppet Theater	159.28	18-1402
2	17	Top of Gopher Tunnel	87.12	20-513
3	14	Quail Trail	80.62	8-532
4	13	Peek-a-boo Insects	43.92	5-303
5	16	In Gopher Tunnel	22.88	6-160
6	10	Climb-on Wood Rat	22.44	3-260
8	8	Wood Rat Lodge	14.22	3-216
9	15	Climb-on Quail	5.96	3-67
10	18	Climb-on Gopher	3.58	5-44
11	20	Seating Nook	3.02	3-132
12	11	Puppet Jump-off	2.72	3-29
13	19	Climb-on Lizard	2.66	10-37

Four children wore animal costumes (provided by the Museum) including one child who wore a costume for most of his visit (14 minutes).

**TABLE 3C: TIME AT COMPONENTS – ENTIRE VISIT**  
 Mean and Range of Time (seconds) Spent at Each Component

Rank	Map #	Exhibit Component			Mean	Range
1	3, 4, 5	All 3 parts of the Stream			348.82	3-1748
	4	Length of Stream			316.80	14-1748
	3	Waterfall			25.56	10-420
	5	End of Stream			6.46	3-110
2	44	Climbing Structure			134.10	9-1236
3	34	Stream Waterbed			93.38	38-544
4	35	Pond Waterbed			91.34	15-602
5	32	Lake Waterbed			85.90	6-487
6	31	Bubble Columns			62.48	12-42
7	33	Waterfall Tunnel			53.66	3-411
8	12	Puppet Theater			48.46	50-508
9	39	Shape Sorter			46.90	10-348
10	42	Indoor Seating and Props			46.26	8-333
11	40	Burrow Bench			34.16	3-367
12	7	Bridge			29.16	10-342
13	17	Top of Gopher Tunnel			26.46	20-342
14	38	The Tunnel			22.48	13-190
15	43	Floor Textures			12.42	10-191
16	13	Peek-a-boo Insects			7.44	12-145
17	6	Climb-on Turtle			5.88	18-74
18	14	Quail Trail			5.32	22-118
19	8	Wood Rat Lodge			5.28	8-125
20	18	Climb-on Gopher			3.3	4-79
21	16	In Gopher Tunnel			2.58	6-51
22	10	Climb-on Wood Rat			2.22	5-43
23	11	Puppet Tree Jump-off			1.78	3-46
24	20	Seating Nook			1.62	16-65
25	1	Animal Tracks			1.4	20-50
26	2	Animal Graphics			1.34	26-34
27	15	Climb-on Quail			.76	3-28
28	19	Climb-on Lizard			.36	3-15

Animal costumes were worn by one child at the Meadow, three in the Water Room and two in the Roots and Rocks Room.

**Repeat Visits**

Children tend to make multiple stops at components as they explore the inside and outside areas of Tot Spot. This behavior is most evident in the Water Room where they make a circuit between the waterbeds and the connecting Waterfall Tunnel. For example, one 2½ year old boy visited the Lake Waterbed, the Waterfall Tunnel and the Stream Waterbed each 10 to 12 times in rapid succession. At the Stream Plaza, children explored the entire length of the Stream, frequently “swimming” the fish from the waterfall to the end. In the Meadow, children repeatedly ran up and down the sides of the Gopher Tunnel, climbed the stairs and rocks and ran through the tunnel.

Children do not move from area to area in a linear manner. A very active 13 month old boy, during his 1½ hour visit, went first to the Stream, then inside to the Water Room, the Roots and Rocks Room, back to the Water Room and the Roots and Rocks Room, and then outdoors again to the Stream and the Meadow. This shows that young visitors to Tot Spot are very different from the older museum visitors in comparative studies who rarely retrace their steps. Contrary to the notion that children have short attention spans, this audience is capable of spending 8 to 29 minutes at a single component.

**TABLE 4A: STOPS AT THE COMPONENTS – STREAM**

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Total Stops</b>	<b>Avg. Stops/child</b>	<b>% children interacting</b>
1	3,4,5,	All 3 parts of Stream	268	5.15	
	4	Length of Stream	171	3.29	96%
	5	End of Stream (Pond)	51	.98	50%
	3	Waterfall	46	.89	48%
2	7	Bridge	46	.89	52%
3	6	Climb-on Turtle	26	.50	33%
4	2	Animal Graphic	4	.08	8%
5	1	Animal Tracks	2	.04	4%

**TABLE 4B: STOPS AT THE COMPONENTS – MEADOW\***

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Total Stops</b>	<b>Avg. Stops/child</b>	<b>% children interacting</b>
1	17	Top of Gopher Tunnel	95	1.91	76%
2	16	In Gopher Tunnel	76	1.52	51%
3	13	Peek-a-boo Insects	54	1.08	78%
4	14	Quail Trail	52	1.04	76%
5	12	Puppet Theater	44	.88	65%
6	8	Wood Rat Lodge	24	.48	37%
7	10	Climb-on Wood Rat	24	.48	37%
8	11	Puppet Jump-off	19	.38	27%
9	18	Climb-on Gopher	17	.34	24%
10	15	Climb-on Quail	14	.28	24%
11	19	Climb-on Lizard	6	.12	12%
12	20	Seating Nook	4	.08	8%

\*8% of the children wore or carried animal costumes.

**TABLE 4C: STOPS AT THE COMPONENTS – ENTIRE VISIT**  
 Mean and Range of Time (seconds) Spent at Each Component

Rank	Map #	Exhibit Component	Total Stops	Avg. Stops/child	% children interacting
1	3, 4, 5	All 3 parts of Stream	135	2.7	
	4	Length of Stream	98	2.0	68%
	3	Waterfall	22	.4	26%
	5	End of Stream	15	.3	22%
2	33	Waterfall Tunnel	128	2.6	60%
3	32	Lake Waterbed	114	2.3	58%
4	34	Stream Waterbed	109	2.2	58%
5	31	Bubble Columns	65	1.3	64%
6	44	Climbing Structure	64	1.3	60%
7	35	Pond Waterbed	58	1.2	50%
8	7	Bridge	42	.8	32%
9	42	Inside Seating and Props	32	.6	42%
10	39	Shape Sorter	30	.6	48%
11	38	The Tunnel	30	.6	42%
12	17	Top of Gopher Tunnel	26	.5	22%
13	43	Floor Textures	26	.5	28%
14	40	Burrow Bench	23	.5	32%
15	12	Puppet Theater	15	.3	22%
16	6	Climb-on Turtle	12	.2	18%
17	13	Peek-a-boo Insects	11	.2	16%
18	11	Puppet Tree Jump-off	9	.2	8%
19	8	Wood Rat Lodge	8	.2	10%
20	16	In Gopher Tunnel	8	.2	12%
21	10	Climb-on Wood Rats	8	.2	12%
22	14	Quail Trail	7	.1	10%
23	18	Climb-on Gopher	6	.1	10%
24	2	Animal Graphics	3	.1	4%
25	15	Climb-on Quail	3	.1	6%
26	20	Seating Nook	2	.04	4%
27	19	Climb-on Lizard	2	.04	4%
28	1	Animal Tracks	2	.04	4%

2% interacted with the costumes.



**Sweeps**

Tracking and timing tells us which components people visited and how long they stayed (i.e. the relative “dwell time” or “holding power” of different components). Sweeps, on the other hand, count the number of people at each component at a point in time. Sweeps give us a measure of the relative “attracting power” of the different exhibit components. There were 100 sweeps of the Stream totaling 1,484 visitors and 49 sweeps of the Meadow totaling 224 visitors. As with holding power, the sweeps show that the most popular elements are the Stream, the Top of and Inside the Gopher Tunnel and the Puppet Theater. The Quail Trail was also popular. Fifty sweeps were conducted for the entire Tot Spot, both inside and out totaling 1402 visitors. Once again, the Length of Stream proved the most popular.

**TABLE 5A: SWEEPS – STREAM**

Number and Percent of Visitors Observed at Each Component

Rank	Map #	Exhibit Component	Number	Percent
1	3, 4, 5	All 3 parts of Stream	1,260	85
	4	Length of Stream	(1075)	72
	5	End of Stream	(123)	8
	3	Waterfall	(62)	4
2	7	Bridge	135	9
3	6	Climb-on Turtle	55	4
4	2	Animal Graphics	23	2
5	1	Animal Tracks	11	1
		<b>Total visitors counted in sweeps</b>	<b>1,484</b>	101

**TABLE 5B: SWEEPS – MEADOW**

Number and Percent of Visitors Observed at Each Component

Rank	Map #	Exhibit Component	Number	Percent
1	17	Top of Gopher Tunnel	57	25
2	12	Puppet Theater	53	24
3	14	Quail Trail	46	21
4	16	In Gopher Tunnel	21	9
5	20	Seating Nook	15	7
6	13	Peek-a-Boo Insects	14	6
7	15	Climb-on Quail	8	4
8	10	Climb-on Wood Rat	4	2
9	18	Climb-on Gopher	4	2
10	8	Wood Rat Lodge	2	1
11	11	Puppet Jump-off	0	0
12	19	Climb-on Lizard	0	0
		<b>Total visitors counted in sweeps</b>	<b>224</b>	101

7 children wore costumes.

**TABLE 5C: SWEEPS – ENTIRE VISIT**  
Number and Percent of Visitors Observed at Each Component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Number</b>	<b>Percent</b>
1		All 3 parts of the Stream	279	19
	4	Length of Stream	231	16
	5	End of Stream	32	2
	3	Waterfall	16	1
2	44	Climbing Structure	152	11
3	35	Pond Waterbed	137	10
4	34	Stream Waterbed	123	9
5	32	Lake Waterbed	105	8
6	31	Bubble Columns	92	7
7	42	Indoor Seating and Props	63	5
8	39	Shape Sorter	59	4
9	12	Puppet Theater	58	4
10	33	Waterfall Tunnel	50	4
11	14	Quail Trail	43	3
12	38	The Tunnel	42	3
13	40	Burrow Bench	36	3
14	43	Floor Textures	36	3
15	17	Top of Gopher Tunnel	34	2
17	13	Peek-a-boo Insects	24	2
18	7	Bridge	19	1
20	6	Climb-on Turtle	11	1
21	10	Climb-on Wood Rat	7	.5
22	2	Animal Graphics	5	.4
23	8	Wood Rat Lodge	5	.4
24	16	In Gopher Tunnel	5	.4
25	20	Seating Nook	5	.4
27	1	Animal Tracks	3	.2
28	11	Puppet Tree Jump-off	3	.2
28	15	Quail Sculpture	3	.2
29	19	Climb-on Lizard	3	.2
30	18	Climb-on Gopher	0	0
		<b>Total visitors counted in sweeps</b>	<b>1402</b>	<b>101%</b>

### **Animal Behaviors**

One of the goals of Tot Spot was to have children learn about animals and their homes. Young children often learn through imitation. Animal costumes were placed in Tot Spot to facilitate children's identification with and exploration of animals.

One child wore a costumes in the outside area, three in the Water Room and two in the Roots and Rocks Room. Buttons which produce Animal Sounds were activated 13 times in the Water Room and 7 times in the Roots and Rocks Room. These activities occurred while the child was at a component and the time was recorded for that component.

**Score**

If we multiply the average holding power of each component by the percent of visitors that stopped at the component (from the sweeps table), we get a combined measure of attracting and holding power or “score”. Here the scores are consistent with the tracking and timing and the sweeps data. For this audience, learning is body-based rather than text-based. As they grow, children expand their understanding of their body and the world around them. They are drawn to components that test their coordination, balance, and strength. Children this age are also working on language development and social skills. At the Stream Plaza, the Length of the Stream has the highest score. At the Meadow, the Puppet Theater scores the highest. These are areas for social play, as are The Top of the Gopher Tunnel and the Quail Trail, which also have high scores. When Tot Spot was looked at as a whole, the Length of Stream scored the highest with a score of 1464, followed by the Climbing Structure, the three different waterbeds, the Bubble Columns, Inside Seating and Props, and the Puppet Theater

**TABLE 6A: SCORE – STREAM**

Mean time (seconds) multiplied by the percent of visitor from sweeps

Rank	Map #	Exhibit Component	Mean	Percent	Score
1	3, 4, 5	All 3 parts of the Stream	500.00	85	425.00
	4	Length of Stream	422.02	72	303.85
	5	End of Stream	40.27	8	3.22
	3	Waterfall	35.00	4	1.51
3	7	Bridge		9	3.15
5	6	Climb-on Turtle	11.83	4	.47
6	2	Animal Graphic	1.58	2	.03
7	1	Animal Tracks	.58	1	0

**TABLE 6B: SCORE – MEADOW**

Mean time (seconds) multiplied by the percent of visitors from sweeps

Rank	Map #	Exhibit Component	Mean	Percent	Score
1	12	Puppet Theater	159.28	24	38.23
2	17	Top of Gopher Tunnel	87.12	25	21.78
3	14	Quail Trail	80.62	21	16.93
4	13	Peek-a-boo Insects	43.92	6	2.64
5	16	In Gopher Tunnel	22.88	9	2.06
6	10	Climb-on Wood Rat	22.44	2	.45
7	15	Climb-on Quail	5.96	4	.24
8	20	Seating Nook	3.02	7	.21
9	8	Wood Rat Lodge	14.22	1	.14
10	18	Climb-on Gopher	3.58	2	.07
11	11	Puppet Jump-off	2.72	0	0
12	19	Climb-on Lizard	2.66	0	0

14% of the visitors wore costumes.

**TABLE 6C: SCORE – ENTIRE VISIT**

Mean time (seconds) multiplied by the percent of visitors from sweeps

Rank	Map #	Exhibit Component	Mean	Percent	Score
1	3, 4, 5	All 3 parts of the Stream	348.86	19	66.28
	4	Length of Stream	316.8	16	50.69
	3	Waterfall	25.56	2	.51
	5	End of Stream	6.46	1	.06
2	44	Climbing Structure	134.1	11	14.75
3	35	Pond Waterbed	91.34	10	9.13
4	34	Stream Waterbed	93.38	9	8.40
5	32	Lake Waterbed	85.9	8	6.01
6	31	Bubble Columns	62.48	7	3.75
7	12	Puppet Theater	48.46	4	1.94
8	39	Shape Sorter	46.9	4	1.88
9	42	Indoor Seating and Props	46.16	5	1.85
10	33	Waterfall Tunnel	53.66	4	1.61
11	40	Burrow Bench	34.16	3	1.02
12	38	The Tunnel	22.48	3	.67
13	17	Top of Gopher Tunnel	26.46	2	.53
14	43	Floor Textures	12.42	3	.37
15	7	Bridge	29.16	1	.29
16	14	Quail Trail	5.32	3	.16
17	13	Peek-a-boo Insects	7.44	2	.16
18	6	Climb-on Turtle	5.88	1	.06
19	8	Wood Rat Lodge	5.28	.4	.02
20	10	Climb-on Wood Rat	2.12	.5	.01
21	16	In Gopher Tunnel	2.58	.4	0
22	20	Seating Nook	1.62	.4	0
23	2	Animal Graphic	1.34	.4	0
24	11	Puppet Tree Jump-off	1.78	.2	0
25	1	Animal Tracks	1.4	.2	0
26	15	Climb-on Quail	.76	.2	0
27	19	Climb-on Lizard	.36	.2	0
28	18	Climb-on Gopher	3.3	0	0

**Exit Interviews**

In October and November 2006, exit interviews were conducted with 100 adults (parents and caregivers) as they were leaving the exhibit area. The frequency of repeat visitation is high for the Tot Spot audience, with some visitors coming weekly or monthly. Each visit is unique with a child developing new favorites depending on their developmental level, skills, and interests.

**TABLE 7: DEMOGRAPHIC INFORMATION ABOUT THE ADULTS INTERVIEWED**

	<b>Totals</b>	<b>Members</b>	<b>Non-members</b>
Interviews	100	69	31
Males	25		
Females (includes nannies)	75		
Average number of adults per family	1.53		
Average number of children per family	1.47		
First time visitors	25	5	20
Visited 2 – 5 times this year	26	16	10
Visited 6 – 9 times this year	18	18	0
Visited more than 10 times this year	31	30	1

**Question 1: Did you visit just the lower, just the upper or both outdoor areas?**

Of the 100 adults interviewed, 52% had visited both areas of outdoor Tot Spot, 43% visited only the Stream Plaza and 5% visited only the Meadow. This is in part due to the popularity of water with this age group and the fact that visitors see the Stream immediately upon entering Tot Spot. The entrance to the Meadow is less visible and the sight lines from the entrance are somewhat obstructed.

**Question 2A: We were just wondering how people perceive these areas. From looking at this (upper) area, what kind of place would you say it represents?**

Overall, 81% of the visitors understood that the Meadow was nature-oriented. Of those, 37% recognized that it was about animal homes and habitats. This supports the interpretive goal that different kinds of animals make different kinds of homes. Visitors mentioned a variety of habitats including burrows, rodent habitats, and tree houses. Two comments are also of interest; they are listed as *Other*, refer to scale. "It's about being the size that animals are."

**TABLE 8: WHAT IS THIS AREA ABOUT? (MEADOW)**

<b>NATURE ORIENTED</b>	<b>82%</b>
Nature, outdoors, woods, forests, mountains	(45%)
Animals homes, habitats	(37%)
Civilized Outdoors	8%
Don't know	6%
Other	4%

**TABLE 9: MEMBERS VERSUS NON-MEMBER PERCEPTIONS**

	Nature, outdoors	Animal Homes	Civilized Outdoors
Member	37%	22%	5%
Non-Member	8%	15%	3%
Total	45%	37%	8%

Responses listed as *Civilized Outdoors* included village, Indian home, farm, garden, backyard and literary references such as “Wind in the Willows” and the Pied Piper.

**Question 2B: What kind of creatures might live there?**

Eighty-four percent of the visitors correctly identified at least one animal that is represented in the Meadow. For example, one visitor listed rats, gophers quail, spiders, butterflies and different animal puppets. Additionally 19% identified animals that could live there such as snakes, bobcat and deer. Some visitors named both animals that are represented and ones that could live in Tot Spot so the total exceeds 100%.

**TABLE 10: CREATURES THAT LIVE IN THE MEADOW**

Animals that are represented in exhibition	84%
Animals that could live there	19%
Other	8%
Don't know	6%
Total	117%

**Question 2C: We were just wondering how people perceive these areas. From looking at this (lower) area, what kind of place would you say it represents?**

The majority of visitors (79%) identified the lower area as a Stream, creek, pond or river. An additional 10% said it was about fish or animals that live in water and 10% thought it was about water or water play.

**TABLE 11: WHAT IS THIS AREA ABOUT? (STREAM)**

Stream, creek, pond, river	79%
Fish, animals that live in water	10%
Water, water play	10%
Other	1%
Total	100%

**TABLE 12: MEMBERS VERSUS NON-MEMBER PERCEPTIONS**

	Stream, creek, pond, river	Fish, animals that live in water	Water, water play
Member	54%	7%	7%
Non-Member	25%	3%	3%
Total	79%	10%	10%

**Question 2D: What kind of creatures might live there?**

It comes as no surprise, since the Stream is stocked with plastic fish and frogs, that 98% of the visitors answered that fish and frogs would live there. Forty-two percent listed additional creatures. These included turtles, birds, insects, tadpoles, salamanders, snakes, plants, beavers and raccoons. Some also listed crabs and starfish because of the presence of plastic ones had migrated from another water feature at the Museum.

**TABLE 13: CREATURES THAT LIVE AT THE STREAM**

Answer includes fish or fish and frogs	98%
Answer includes additional creatures	42%
Other – answer does not include fish	2%
Total	142%

**Question 3: Do you or your child have favorite activities in either of these areas?**

Eighty percent of the adults interviewed listed the Stream as their child’s favorite activity in the outdoor portion of Tot Spot. Activities at the Stream included dropping the fish off the bridge and having salmon swim upstream. Multiple answers included, “Tunnel, puppets and fish. Really, though, they do a different thing every time they come. That’s what so great about it.” Two parents had children with favorite activities different from the norm. One mother said her daughter’s favorite activity was the Quail Trail. “She kissed them goodbye when we left.” Another parent listed the animal tracks. Her child enjoyed seeing what they look like in real life.

**TABLE 14: FAVORITE ACTIVITIES**

Stream/playing with fish	80%
Multiple favorite activities	20%
Climbing and running (esp. tunnel and large animals)	20%
Puppets	12%
Other	6%
Quail Trail	5%

**Question 4: On a scale of 1 to 5, with 5 being the highest, how do you think your CHILD would rate his/her level of enjoyments of the outdoor part of Tot Spot?**

Parents rated their child’s average level of enjoyment 4.66 on a 5-point scale.

**Why would you rate it this way?** (Some responded to more than one category)

Three categories scored the highest. Twenty-nine respondents described how much their child loved Tot Spot and how they didn’t want to leave. Their comments included:

*“Every time is different and every time it’s a 5.”*

A similarly sized group (28%) cited the water and playing with fish, including getting wet, as their child’s favorite activity. They, too, used expressions of love to describe their child’s level of enjoyment such as. “He loves getting wet.”

As one parent noted,

*“They’ll stay the whole time (at the Stream) if they can. Kids love water.”*

The social aspect was also important for 17% of those polled. One little boy was celebrating his birthday with three friends from his preschool, which was conveniently closed for the day. One parent commented that her daughter’s

*“personality comes out here more than anywhere else we visit.”*

About 10% felt that their child preferred other parts of the museum or that the outside area of Tot Spot was not age appropriate. There were 8 respondents who thought the variety of activities, especially the physical activities and opportunities to use their imagination, contributed to their level of enjoyment.

**TABLE 15: REASON FOR RATING (CHILD)**

	Percentage
Affect/Love/Doesn’t want to leave	29%
Specific component – Stream and fish	28%
Fun/Social/Great time	18%
Prefer other part of the museum/Outdoor not age appropriate	11%
Lots to do/Physical activity/Explore/Use imagination	8%
Other	8%

**Question 5: On a scale of 1 to 5, with 5 being the highest, how would you rate YOUR level of enjoyments of the outdoor part of Tot Spot?**

Parents rated their average level of enjoyment almost identical to their child’s at 4.65 on a 5-point scale.

**Why would you rate it this way?** (Some responded to more than one category)

The two frontrunners for this question were the adult’s own enjoyment and their pleasure in observing the child’s enjoyment. One mother commented, “When I come here my face hurts from smiling so much.” Safety and being able to interact with their child were also cited.

*“She has developmental delays. Every time we visit, it gives me something to work on with her. For parents, there are so many things to talk to your child about here.”*



Additionally, families appreciated the natural beauty of the location. One mother summed it up,

*“I’m never bored. I love all the staff. They make an extra effort to say hello. It’s probably the only area in the Bay Area that I feel comfortable letting him run.”*

**TABLE 16: REASON FOR RATING (ADULT)**

	Percentage
Own enjoyment/Relaxing	37%
Child’s enjoyment/Good for child	33%
Good for watching child/Safety	11%
Other	11%
Weather/Location	9%
Interaction with child	6%

**Question 6: Were there any particular areas where you and your child played together. If yes, which ones?**

Seventy-nine percent of the adults responded affirmatively that they played with their children at the outdoor Tot Spot. The places they list are the components with the highest score. Almost half (41%) of those interviewed said that this interaction happened at the Stream where they “collected fishes and splashed in the water.” Many (17%) commented that they played in many or all the areas with their child. “All of them. We are just big kids ourselves.” Often the child directed the type and location of the play. As a Grandfather responded,

*“If they want me to play, I play. If they want to do it on their own, I let them be.”*

The same was true in the puppet theater where 15% of the visitors put on shows or served as the audience.

*“We were the puppet show audience. They (the children) take control.”*

Visitors also named climbing atop the Gopher Tunnel, the Quail Trail and the Peek-a-boo Flowers.

**TABLE 17: PLAYED TOGETHER**

	Percentage
Stream	41%
All/many areas	17%
Puppet Theater	15%
Tunnel, Quail Trail, Peek-a-boo Flowers	10%

**Question 7: Were there activities here that you think helped your child to develop or stretch their physical or social skills?**

Over 70% of the parents and caregivers did perceive that the activities helped their child to develop or stretch their physical and social skills. Fine and gross motor skills were developed and stretched during visits, from “climbing, learning how to put fingers into the arms of puppets, and getting onto the quail.” The uneven terrain and spongy rocks helped with balance. One mother commented that her son flirted with “older girls – he

likes the ones who barely fit through the arch.” This is a reference to the height restrictions at Tot Spot, which limit the area to children under 42”.

**TABLE 18: ACTIVITIES THAT DEVELOPED SKILLS**

	Percentage
<b>Physical</b>	<b>72%</b>
Climbing/Stair climbing/balance	42%
Walking/Running/Crawling/Jumping	16%
Fine motor skills	9%
Experimenting with water/exploring	5%
Challenges/confidence building	4%
Awareness of smaller children	3%
Other	3%
<b>Social</b>	<b>71%</b>
Taking turns/sharing/developing good manners	42%
Making friends/interacting with others	32%

**Question 8: Did you notice any signs especially for parents about how children learn? If yes, what did you think of them?**

There is a total of 10 signs in the Outdoor Tot Spot, 5 of which refer to how children learn and 5 of which talk about animal behavior. Thirty percent of the adults interviewed read the signs; 15% remembered the parent messages, 6% had read the animal behavior signs, and 9% had a positive response to the signs but did not name a specific sign. Six parents mentioned the sign about repetition, which states: If your child is doing it for the 100<sup>th</sup> time, he’s still learning. “Good to know. He’s at a repetitive stage.” They felt the signs were “a nice reminder for parents.” One mother didn’t read them because her daughter has developmental delays and she

*“assumed they were goal-oriented and didn’t want to be nervous if her child hadn’t met those goals yet.”*

**TABLE 19: ADULTS RESPONSE TO SIGNS**

Type of sign	Percentage
How children learn	15%
Animal behavior	6%
Positive response	9%

**Question 9. Were there any places that you thought needed to be safer? If yes, which ones?**

The majority of visitors (88%) felt that Tot Spot was very safe. Comments about safety centered on concerns that children could fall, trip or scratch themselves on components. Two parents were worried about children running off and one questioned the purity of the water in the Stream.

**TABLE 20: SAFETY ISSUES**

<b>Safe</b>	<b>Trip/fall/scratch</b>	<b>Child run away</b>	<b>Water purity</b>
88%	9%	2%	1%

**10. Is there anything else you would like to tell us about Tot Spot?**

Despite the length of the interview, over half of the adults (52%) had additional comments. There were thirty-six positive comments, such as: “They do a different thing every time they come. That’s what’s so great about it.” One mother lamented, “We love this place. I’m going to be sad when he gets too old. I’ll have to start baby-sitting younger children.” One parent who, like many members, comes once a week, commented, “Keep up the good work. It’s the best morning we spend together.” One family was so inspired by their visit that they went home and made a puppet theater based on the one in the Meadow. The staff drew enthusiastic comments, which the evaluator promised to mention. “Please put down that we really love the people who work here. It’s so joyful to come here because he (the child) has his friends who work here. They know him by name.” There were 17 other comments. These were primarily suggestions on ways to improve Tot Spot, including the addition of more frogs, aprons and a snake sculpture.

**TABLE 21: OTHER COMMENTS – POSITIVE**

<b>Love it</b>	<b>Staff/Music</b>	<b>Variety</b>	<b>Design</b>	<b>Safety</b>	<b>Total</b>
20	6	5	3	2	36

**TABLE 22: OTHER COMMENTS – NEGATIVE**

<b>Suggestion</b>	<b>Too young/old</b>	<b>Other</b>	<b>Total</b>
10	5	2	17

### **Behavioral Observations**<sup>1</sup>

Tot Spot stimulates learning through play and exploration appropriate for children four and under and their caregivers. The outdoor area focuses on investigating animals and their homes in streams, woods and meadows. The following section is based on observations of 34 children at the Stream and 30 children at the Meadow. At the Stream, 20 were girls and 14 were boys while at the Meadow the genders were equally represented. The average age for visitors at the Stream was 2.38 years and at the Meadow it was 2.75 years. These visitors spent the same amount of time on average (14:09 minutes at the Stream and 14:47 minutes in the Meadow) in both areas. Note that this is more time than was seen in the tracking and timing study.

Upon entering Tot Spot, most children head straight for the Stream, the most popular component in the outdoor area. This is a focused activity where children have a variety of experiences from patting and splashing the water to “swimming” the plastic fish the length of the Stream. Many children were delighted to discover that the fish are hollow so they fill up with water, acting like squirt guns. At the Stream, children learn to share, despite their inclination to hoard all the fish and frogs; to be respectful of others by not splashing or crowding; and to play cooperatively in an often-crowded space.

In the Meadow, children visited an average of 5½ components. The puppet theater elicited the most discussion of animals and animal homes. When visitors discovered the puppet theater, they stayed for extended periods of time. Over a quarter of the visitors stayed for at least 5 minutes, with the longest visit lasting 23 minutes. Performances involved both parents and children. This included parents showing their children how to manipulate the puppets, teaching them the names of the animals depicted by the puppets and mimicking animal behaviors and sounds. Two fathers at separate times acted out elaborate performances. They gave proper names to the puppets, for example Benny the Beaver, and enacted a characteristic of each animal. Benny used his beaver teeth to gnaw on the wooden supports of the theater. There were also some comical performances. One little girl either had just visited Disneyland or was hoping to visit soon so the puppets were on their way to Disneyland where they would go on the roller coaster and waterslide. When parents asked what food the puppets ate, children responded with everything from fast food purchased at McDonalds, to donuts, to a more palatable nut casserole for the squirrels.

Visitors used both the puppet and exhibit components to reinforce the importance of being kind to animals. In one instance, when a mom commented that she was scared of bats, her child replied, “This is a nice bat, Mom.” Visitors also discussed animals and animal behavior. During a lunch break, spent in the Seating Nook, a mother and daughter discussed foghorns and birds.

*“Look, hummingbirds! Two of them. They landed right in front of you. A bird, when it lands somewhere, it perches.”*

She then had the little girl repeat perch. At the Quail Trail, a girl pointed to a graphic on the base and said “eggs.” Her mother replied,

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<sup>1</sup> Rules used in coding are listed in the Lookout Code Behavioral Coding Definitions.

*“That’s how birds are born. The mom lays an egg and then sits on it to hatch it.”*

Children petted and climbed on the animals, gave them names and fed them eucalyptus pods and leaves. Children riding on the back of oversized creatures frequently provided a photo opportunity.. The Climb-on Quail was particularly popular. At the Quail Trail, one little girl pointed to the adult-sized quail and said, “Papa.” Then she exclaimed, “I found the Mama and babies,” and gave each quail a name, including Sasha. One father, encouraging his daughter to move the quail, chanted, “Slide, slide, slide like a slithering snake.” One mother, though, commented,

*“There’s the lizard. I forget about him. He’s something that surprises you.”*

The Meadow is an active place. Children enjoy running up, down and through the gopher tunnel. For some, the challenge is climbing the different types of stairs, for others it is hopping from one spongy rock to the next. The Stream is more frequently visited than the Meadow, in part because of the appeal of water to small children. It is also directly downhill from the entrance and the first thing they see upon entering Tot Spot. Many visitors fail to notice the Meadow, which requires a hard right turn from the entrance. When looking through the gateway to the Meadow, a tree blocks their view of most of the components. An important factor that affects the behavior of all visitors to Tot Spot is the weather. If it is cold or cloudy, parents and caregivers steer their children away from the water and towards the indoor area.

### **Summary**

Tot Spot stimulates learning through play and exploration appropriate for children four and under and their caregivers. It consists of indoor and outdoor environments each of which includes both a water-themed and a forest-themed area. Summative evaluation for the indoor area is reported elsewhere. This report focuses on summative evaluation of the outdoor Tot Spot. The outdoor area focuses on investigating animals and their homes in streams, woods and meadows. It is a large area, 9,200 square feet, of which 5,812 square feet are exhibits and 3,200 square feet are landscaped. A goal of Tot Spot was to use native animals and their homes to engage children and their caregivers in developmentally appropriate play and exploration. Tot Spot was specifically designed for children under 4 years as a safe and developmentally appropriate space. The average age for all children included in this project is 2.37 years.

Children spend a long time at outdoor Tot Spot, averaging 33 minutes. Their visit is non-linear with many instances of repeat visits to components. They also spend extended periods at particular components, especially the Stream. Components with the greatest holding power, the Stream Plaza, Puppet Theater, and Gopher Tunnel seem to satisfy specific developmental needs for children including the development of: fine motor, social interaction, and gross motor skills. The frequency of repeat visitation is high for the Tot Spot audience, with some visitors returning weekly or monthly. However, each visit is unique with children finding new favorites as they develop new skills and interests.

A goal of outdoor Tot Spot was to convey to children that different kinds of animals make different kinds of homes. Overall, 81% of the visitors understood that the Meadow was nature-oriented. Of those, 37% recognized that it was about animal homes and habitats. Eighty-four percent of the visitors correctly identified at least one animal that is represented in the Meadow. Since the Stream is stocked with plastic fish and frogs, it is not surprising that 98% of the visitors were able to say that fish and frogs would live there. Twenty-nine respondents described how much their child loved Tot Spot and didn't want to leave. Their comments included "Every time is different and every time it's a 5." Parents rated their average level of enjoyment 4.65 on a 5-point scale for both the adult's own enjoyment and their pleasure in observing the child's enjoyment.

*"When I come here my face hurts from smiling so much."*

Seventy-nine percent of the adults responded affirmatively that they played with their children at the outdoor Tot Spot. Over 70% of the parents and caregivers did perceive that the activities helped their child to develop or stretch their physical and social skills. At the Stream, children learn to share, to be respectful of others by not splashing or crowding, and to play cooperatively in an often-crowded space. Children riding on the back of oversized creatures frequently provided a photo opportunity. The Meadow is an active place. Children enjoy running up, down and through the gopher tunnel.

A critical appraisal of Tot Spot was conducted by Lorrie Beaumont of Evergreene Research and Evaluation in November 2006. Beaumont observed that "there was much *cooperative and cross group play*. Most of the children played with whoever was nearby, inventing games and role playing with their animals" and that "Children seemed to share easily in this environment."

Beaumont observed that caregivers were "being *students of their children's play*, learning about their child's growth and development by watching their play and listening to their language." In the Meadow, Beaumont observed a different kind of play "Physical play in this area was much more about large motor ... the Woodland area likely gives these younger children a sense of a wide open space." In both Stream and Meadow areas children were observed to be involved with the animal life represented there: "Children at this young age can more easily empathize with animals than they can with humans and they often exhibit these kinds of *caretaking* behaviors in their pretend play with animals."

Long dwell times, frequent repeat visits, high ratings and direct visitor comments all attest to the success of Tot Spot. As an outdoor play area, it is both aesthetically appealing and conducive to the creation of children's narratives. There are representations of animal species and habitats, opportunities for large and small motor activity, and for social interaction, particularly across generations. The Stream, Puppet Theater, Gopher Tunnel, Wood Rat Lodge and other structures serve as platforms about which children can create their own stories that blend activity and fantasy while incorporating elements of the natural world.

**Wave Workshop Summative Evaluation**

Prepared by Minda Borun and Rose Kelly

August 2007

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### **Introduction**

The Wave Workshop permanent exhibition has three adjoining sections: Toddler Beach, Wave Workshop, and Under the Waves. With the exception of Toddler Beach, the exhibit was designed for 4-8 years olds. Unfortunately, the audience is predominantly pre-schoolers with an average age of 3.5 years. Thus the original goals of the area are only partially achieved.

### **Goals**

Original goals for Wave Workshop were to:

1. Acquaint visitors with organisms' structural adaptations to local wind and water currents.
2. Challenge visitors to expand their skills and interests.
3. Give visitors experience with the inquiry process and discovery learning.
4. Foster visitors' understanding and appreciation of local animals.

Strategies for achieving these goals involved designing three rooms, each of which focuses on a different approach to understanding and appreciating the local marine environment.

1. *Toddler Beach* stimulates young visitors by highlighting the textures, patterns, materials and sea life one might encounter at the shore's edge.
2. *Wave Workshop* shows that animals, people, and man-made things all share the same shape that helps them move in wind and water.
3. *Under the Waves* fosters appreciation of the diversity and behaviors of sea creatures through dress-up and role-playing activities.



**Summative Evaluation**

This Report summarizes four data sets collected for the summative evaluation of Wave Workshop.<sup>1</sup>

- Tracking and timing of children through the exhibit (N=50 subjects) May 2007
- Sweeps (counting the number of children at each component) (N=50 sweeps) May 2007
- Exit Interviews with adults (N=100 subjects) May and June 2007.
- Behavioral observations of adult/child groups (N=30 groups) May 2007.

**Tracking and Timing**

Wave Workshop is 1900 square feet in 3 separate adjoining rooms: Under the Waves, Wave Workshop and Toddler Beach. The average time in the exhibit was 18 minutes 32 seconds. The longest visit observed was 1 hour. Most families engaged with an average of 8 (32%) out of the 25 components available.

**TABLE 1: TRACKING SUMMARY (N=50)**

	<b>Average</b>	<b>Range</b>
Time in Whole Exhibit	18-1/2 minutes	3-1/2 minutes to 1 hour
Under the Waves	3 minutes	0 to 21 minutes 18 seconds
Wave Workshop	7-1/2 minutes	0 to 35 minute 40 seconds
Toddler Beach	3 minutes	0 to 15 minutes 2 seconds
Number of components visited	8 (32%)	1 to 16

**TABLE 2: DEMOGRAPHICS of TRACKING SAMPLE**

	<b>Number</b>	<b>Percent</b>
Boys	34	68
Girls	16	32
Totals	50	100

Average age of children: 3.5 years. Children observed walked into exhibit on their own.

**Holding Power**

Visitors spend three times as long at the Racing Table as at the next most popular component, the Green Screen. The two other water features, the Flume Table and the Wave Tank, are among the top 5.

<sup>1</sup> Data was collected primarily by Rose Kelly and Justin Collins.

**TABLE 3: TIME AT COMPONENTS**  
Mean and Range of Time (seconds) spent at each Component

<b>Rank</b>	<b>Room</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Range</b>
1	WW	9	Racing/Sailing Table	245.3	0-1454
2	UTW	5	Green Screen	78.7	0-1071
3	WW	11	Flume Table	72.2	0-430
4	WW	10	Wind Table	65.5	0-335
5	TB	19	Wave Tank	64.7	0-287
6	TB	22	Sand Table	58.3	0-620
7	UTW	6	Rocky Habitat/Slider	35.3	0-457
8	WW	12	Rheostatic Fluid Tank	30.1	0-193
9	TB	17	Bay in a Bottle	29.3	0-360
10	UTW	7	Bay View Buoy	27	0-464
11	UTW	2	Magnetic Animals	25.8	0-205
12	WW	8	Touchable Artifacts	24.1	0-338
13	WW	13	Sandy Aquarium	21.6	0-334
14	TB	20	Large Sand Wheel	14.8	0-104
15	TB	18	Fish Puzzle	11.5	0-156
6	UTW	1	Mechanical Ocean	7.8	0-98
17	TB	23	Small Sand Wheel	6.8	0-76
18	WW	16	Shape Slider	2.4	0-76
19	WW	14	Intro Graphics	0.4	0-22
20	WW	15	Teardrop Shape Display	0	0
21	TB	21	Sands around the Bay Graphics	0	0

# 3 Costumes and #4 Plush Sea Creatures were coded as yes or no since they were usually used simultaneously with another component.

#### **Distribution of time spent during visit**

Visitors are spending the same amount of time in Under the Waves and Toddler Beach and over twice as long in Wave Workshop. This is understandable since the five components with the longest dwell time are all in Wave Workshop. Only half the visitors are visiting all three rooms (52%) while a quarter (24%) went to both the Wave Workshop and the Toddler Beach. Two children visited only Wave Workshop, while 4 only went as far as the Toddler Beach and 1 only visited Under the Waves. Children don't ricochet between components as noted in other areas of the museum. Rather, the majority select to visit a few components once or twice.

**TABLE 4: STOPS AT COMPONENTS**

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Total Stops</b>	<b>Avg. Stops/child</b>	<b>% children interacting</b>
<b>1</b>	<b>9</b>	<b>Racing/Sailing Table</b>	<b>74</b>	<b>1.48</b>	<b>74%</b>
<b>2</b>	<b>5</b>	<b>Wave Tank</b>	<b>59</b>	<b>1.18</b>	<b>76%</b>
<b>3</b>	<b>10</b>	<b>Wind Table</b>	<b>52</b>	<b>1.04</b>	<b>62%</b>
4	6	Rocky Habitat/Slider	43	.86	48%
5	5	Green Screen	40	.8	48%
6	22	Sand Table	40	.21	42%
7	11	Flume Table	39	.78	58%
8	20	Large Sand Wheel	28	.56	38%
9	1	Mechanical Ocean	27	.54	42%
10	12	Rheostatic Fluid Tank	26	.54	42%
11	7	Bay View Buoy	24	.48	32%
12	2	Magnetic Animals	22	.44	32%
13	8	Touchable Artifacts	22	.44	34%
14	17	Bay in a Bottle	22	.44	30%
15	13	Sandy Aquarium	20	0.4	32%
16	18	Fish Puzzle	19	.38	34%
17	23	Small Sand Wheel	17	.34	26%
18	16	Shape Slider	10	.08	8%
19	14	Intro Graphics	.02	1	2%
20	15	Teardrop Shape Display	0	0	0%
21	21	Sands around the Bay Graphics	0	0	0%

**Sweeps**

Tracking and timing tell us which components people visited and how long they stayed i.e. the relative “dwell time” or “holding power” of the different components. Sweeps on the other hand, count the number of people at each component at a point in time. Sweeps give us a measure of the relative “attracting power” of the different exhibit components. There were 50 sweeps of Wave Workshop totaling 1,011 visitors.

From the sweeps, we see again that the most popular components are the Racing Table, the Green Screen, the Flume Table, the Wind Table and the Wave Tank.

**TABLE 5: SWEEPS**

Number and percent of visitors observed at each component

<b>Rank</b>	<b>Room</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Number</b>	<b>Percent</b>
1	WW	9	Racing/Sailing Table	233	23%
2	UTW	5	Green Screen	138	13.6%
3	WW	11	Flume Table	91	9%
4	WW	10	Wind Table	74	7.3%
5	TB	19	Wave Tank	72	7.1%
6	TB	22	Sand Table	40	4%
7	WW	6	Rocky Habitat/Slider	39	3.9%
8	UTW	7	Bay View Buoy	39	13.9%
9	UTW	2	Magnetic Animals	38	3.8%
10	WW	8	Touchable Artifacts	36	3.6%
11	WW	13	Sandy Aquarium	36	3.6%
12	WW	12	Rheostatic Fluid Tank	33	3.3%
13	UTW	1	Mechanical Ocean	27	2.7%
14	UTW	3	Costumes	26	2.6%
15	TB	20	Large Sand Wheel	25	2.5%
16	TB	17	Bay in a Bottle	23	2.3%
17	WW	4	Plush Sea Creatures	13	1.3%
18	TB	18	Fish Puzzle	11	1.1%
19	TB	23	Small Sand Wheel	9	.9%
20	WW	16	Shape Slider	5	.5%
21	WW	14	Intro Graphics	3	.3%
22	WW	15	Teardrop Shape Display	0	0%
23	TB	21	Sands around the Bay Graphics	0	0%
			<b>Total</b>	<b>1011</b>	<b>100%</b>

**Score**

If we multiply the average holding power of each component by the percent of visitors that stopped at the component (from the Sweeps Table), we get a combined measure of attracting and holding power or “score.” Here the scores are consistent with the Timing and Tracking and the sweeps data.

**TABLE 6: SCORE**  
Mean time (seconds) multiplied by the percent of visitors

Rank	Room	Map #	Exhibit Component	Mean	Percent	Score
1	WW	9	Racing/Sailing Table	245.3	23%	56.42
2	UTW	5	Green Screen	78.7	13.6%	10.70
3	WW	11	Flume Table	72.2	9%	6.50
4	WW	10	Wind Table	65.5	7.3%	4.78
5	TB	19	Wave Tank	64.7	7.1%	4.59
6	TB	22	Sand Table	58.3	4%	2.33
7	UTW	6	Rocky Habitat/Slider	35.3	3.9%	1.37
8	UTW	7	Bay View Buoy	27	3.9%	1.05
9	WW	12	Rheostatic Fluid Tank	30.1	3.3%	.99
10	UTW	2	Magnetic Animals	25.8	3.8%	.98
11	WW	8	Touchable Artifacts	24.1	3.6%	.87
12	WW	13	Sandy Aquarium	21.6	3.6%	.78
13	TB	17	Bay in a Bottle	29.3	2.3%	.67
14	TB	20	Large Sand Wheel	14.8	2.5%	.37
15	UTW	1	Mechanical Ocean	7.8	2.7%	.21
16	TB	18	Fish Puzzle	11.5	1.1%	.13
17	TB	23	Small Sand Wheel	6.8	.9%	.06
18	WW	16	Shape Slider	2.4	.5%	.01
19	WW	14	Intro Graphics	.4	.3%	0
20	WW	15	Teardrop Shape Display	0	0%	0
21	WW	21	Sands around the Bay Graphics	0	0%	0

# 3 Costumes and #4 Plush Sea Creatures were coded as yes or no since they were usually used simultaneously with another component. Since they were not timed, they do not have a score.

Wave Workshop is housed in a rehabilitated military building. Its linear layout strongly influences visitor's behavior. The three interconnected rooms all have doors along the Bay side of the building. This means that visitors are less inclined to notice or interact with components on the opposite side of the rooms, especially in the middle room. A large wave table dominates the central space and affects the flow. The components with the lowest score such as the Shape Slider, the Tear Drop Vitrine, and the Small Sand Wheel are all located on the less-traveled side of the exhibition.

### **Exit Interviews**

Interviews were conducted with 100 adults (parents and caregivers) upon leaving the exhibit area of Wave Workshop in May and June 2007. When approached about being interviewed, men often responded, "No, thank you." and declined to be interviewed or turned the interview over to their wives. Additionally, many of the adults at the museum during the week are nannies. As a result, 83% of the interviewees were women. All 36 visitors who visited over 6 times were members.

**TABLE 7: DEMOGRAPHIC INFORMATION ABOUT THE ADULTS INTERVIEWED**

	<b>Totals</b>		
Interviews	100		
Males	17		
Females	83		
Average number of adults per group	1.5		
Average number of children per group	1.7		
95 boys/75 girls – average age	3.52 yrs		
		<b>Members</b>	<b>Non-Members</b>
First time visitors to Wave Workshop	30	12	18
Visited 2 – 5 times	34	27	7
Visited 6 – 10 times	19	19	0
Visited More than 10 times	17	17	0
BADM members		75	25

The sample size for adult interviews was 100, making the percent given equal to the number of people who chose a response.

**Question 1: We were just wondering how people perceive this building. There are no right or wrong answers. What would you say this area is about?** (Some gave more than one category of response)

The majority of visitors (68%) responded that the building was about waves, water, currents, and the ocean or the bay. Interestingly, none of them referred to the name of the building, Wave Workshop, which could be considered a clue to the theme of the exhibition. Over one third (35%) identified fish, sea life and different environments, including being under the sea. One child, when asked by his mother what he thought, responded,

*“Science and fish. I call it the Ocean Building, the Sea Building, because there’s lots of fish.”*

Half (52%) said that it was about how water and wind work and that it “explored the way current and wind effect different objects.” Many visitors had multiple answers that spanned these categories.

*“The rooms were about different things. The first was about parts of the ocean. The middle was about currents and how waves work and the last was about sea life.”*

**TABLE 8a: WHAT IS THE AREA ABOUT?**

	<b>Percent</b>
<b>Waves, water, ocean, tides, tide pools, currents</b>	<b>68%</b>
Hydrodynamics/aerodynamics, mechanics of waves, how water and wind work, motion, energy, science/physics, how wind and water affect/move things	52%
Sea life, fish, shells, interacting with creatures in the Bay/Ocean, being under the sea	35%
Other, including learning and hands-on	4%

**TABLE 8b: MEMBER VERSUS NON-MEMBER PERCEPTION**

	<b>Waves</b>	<b>How wind/water work</b>	<b>Sea life, being under the sea</b>	<b>Other</b>
Member	55	40	26	3
Non-member	13	12	9	1
Total	68	52	35	4

**Question 2: On a scale from 1 to 5, with 5 being the highest, how do you think your child would rate his/her level of enjoyment of this area?**

Parents rated their child’s average level of enjoyment 4.22 on a 5-point scale.

**Why would you rate it this way?** (Some gave more than one category of response)

Many parents (34%) connected their child’s level of enjoyment with specific components. Twenty visitors linked it to water activities, especially the Racing Table. One mother commented, “Anything with water thrills them!” A third of the parents (37%) responded that their child was too young for the exhibit. “It’s not age appropriate for her, but will be later.” This is not unexpected since Wave Workshop was designed with 4-to 8-year-olds and school groups in mind. Signage cues adults that the room is for this age group and that younger children may need additional assistance. In answering this question, a third of the adults (33%) came up with their rating in relationship to other exhibits at the Museum, which their child preferred over Wave Workshop. One father who rated it at 2-1/2 for his 4-year-old son explained,

*“In general, the stuff in there is stuff he likes. If it’s crowded, you don’t get a turn (at the Racing Table). Everyone wants to do racing. The other stuff doesn’t hold his attention as much as Bay Hall. He can stay in there for an entire visit.”*

Some visitors said it was their child’s favorite exhibit at the Museum. The mother of a 3-year-old was relieved that her son’s interest had changed from the trains in Bay Hall to reptiles and sea creatures. She found visiting Wave Workshop much more interesting than Bay Hall. One parent commented that having a Discovery Guide explain the racing mechanisms to her family made for a richer experience. Another parent said her 3-year-old daughter was mesmerized by racing. She also loves the “TV thing”.

**TABLE 9: REASON FOR RATING (CHILD)**

	<b>Percentage</b>
Specific component such as Racing Table, Green Screen	34%
Liked water/racing /fish	20%
Preferred other area at Museum, not age appropriate	33%
Affect/likes/loves Wave Workshop/Museum, has fun	27%
Other	2%

**Question 3: On a scale from 1 to 5, with 5 being the highest, how would you rate your level of enjoyment?**

The average level of enjoyment was rated 4.28 for adults. This was very close to the rating they gave for their child’s point of view.

**Why would you rate it this way?** (Some gave more than one category of response)

The two responses that were frontrunners for this question were the adult’s own enjoyment and their pleasure in observing the child’s enjoyment. Forty-two percent said that they were enjoying themselves. One mother commented that when she brings friends to the Museum, they say, “Why don’t we have something like this where we live?” Thirty percent said if their child was having a good time, they were happy. “Anytime my kid is having that much fun, it’s a 5 for me, too!” Many adults were also interested in the exhibits, including a marine biologist who visited with her 1- and 5-year-old and commented that it was “the best display about the ocean and the Bay” that she had seen.

**TABLE 10: REASON FOR RATING (ADULT)**

	<b>Percentage</b>
<b>Own enjoyment/ Relaxing</b>	<b>42%</b>
<b>Child’s enjoyment</b>	<b>30%</b>
Interested in exhibits/concepts	24%
Busy watching child/tired/not interested	9%
Other	4%

**Question 4: This is a very large exhibit – here’s a map of it. I’d like you to circle on the map the places you went.**

Table 11a indicates how many groups visited each component and how many ranked it as one of their favorites. Groups could have more than one favorite. The components that involved water and the Green Screen ranked the highest. The Racing Table was the favorite for over a third (38%) of the visitors. The Wave Tank also ranked among the top three. The Green Screen was identified as a favorite by 18% of the visitors while costumes and plush sea creatures, often used in conjunction with the Green Screen, were each chosen by 8% of the visitors.



**TABLE 11a: COMPONENTS MOST VISITED/  
FAVORITE COMPONENTS.**

Map #	Room	Component	Visited	Favorite
9	WW	Racing/Sailing Table	78	38
19	TB	Wave Tank	74	12
5	UTW	Green Screen	52	18
11	WW	Flume Table	46	10
10	WW	Wind Table	43	7
6	UTW	Rocky Habitat/Slider	41	3
17	TB	Bay in a Bottle	40	8
21	TB	Large Sand Wheel	39	3
7	UTW	Bay View Buoy	37	5
13	WW	Sandy Aquarium	32	3
2	UTW	Magnetic Animals	26	4
22	TB	Sand Table	25	5
1	UTW	Mechanical Ocean	24	2
4	UTW	Plush Sea Creatures	24	8
12	WW	Rheostatic Fluid Tank	24	4
3	UTW	Costumes	23	8
8	WW	Touchable Artifacts	22	2
23	TB	Small Sand Wheel	15	1
16	WW	Shape Slider	7	0
18	TB	Fish Puzzle	6	0
15	WW	Teardrop Shape Display	5	0
21	TB	Sands around the Bay Graphics	3	0
14	WW	Intro Graphics	1	0

**Question 5: Were there activities here that you think helped your child to learn something about science or nature or stretch their physical or social skills?** (Some gave more than one category of response)

Ninety-four percent of the parents and caregivers did perceive that there were activities that helped their child to learn about nature and/or develop or stretch their physical or social skills. Of those, 72% stated that their child learned something about nature or science especially when using an exhibit component. One grandmother commented,

*“When they are probably seeing something they’ve never seen before, it plants an idea.”*

She thought that a future experience might trigger a memory of what they saw and did in Wave Workshop allowing them to build on what they learned at the Museum.

More than half the parents also observed that their children stretched their physical and social skills. They developed their fine motor skills while manipulating interactive elements of the components (32%) as well as their gross motor skills while dancing in front of the Green Screen (10%). The mother of a 2

½-year-old was so amazed that her child spent 10 minutes spinning the Large Sand Wheel all by himself that she called his father at work to share the experience. Children worked on developing their social skills (62%) by sharing and taking turns as well as making new friends.

**TABLE 11b: ACTIVITIES THAT DEVELOPED SKILLS**

Activity	Percentage
<b>Science or Nature</b>	<b>72%</b>
Using component to learn about nature/science	50%
Observing, identifying using imagination to learn about animals	16%
Yes, but couldn't pinpoint it	10%
Being stimulated, absorbing information	6%
<b>Physical</b>	<b>53%</b>
Fine motor skills - manipulating levers/pulleys/cranks/magnets	32%
Gross motor skills - running/spinning/dancing	10%
Yes, but couldn't pinpoint it	13%
<b>Social</b>	<b>62%</b>
Taking turns/ sharing/ developing good manners	38%
Social play/Making friends/Creating performance	27%
Yes, but couldn't pinpoint it	8%

**Question 6: Did you notice any signs in these 3 rooms that explained any of the exhibits? If so, can you tell me one thing you found interesting or helpful?**

There were a total of 15 signs in Wave Workshop. Forty-three percent of the adults interviewed read one or more sign. Ten percent commented that they liked the signs, especially the fact that they were in three languages. One parent commented that the costume labels helped her children to recognize the animals and provided clues such as “playful” to describe their behavior so that the children could emulate proper animal behavior.

**TABLE 12: VISITORS WHO READ SIGNS**

Wave	Fish	Sands	Cost-umes	Wind	Buoy	Shapes	Other	Total
11	7	4	3	2	2	2	3	43
11%	7%	4%	3%	2%	2%	2%	3%	43%

**Question 7: Did the exhibit spark any ideas for other activities to do with your children outside the museum?**

Half of the visitors (54%) had one or more ideas for other activities to do after they left the museum. Many (22%) had ideas of how to recreate the museum experience at home. Some ideas were as simple as starting a shell collection or having a variety of water play activities. One parent wanted to design a dress up area so her children could

*“use the immersion of dress up and its physicality to help them learn about animals. It isn't just observing them.”*

She wanted them to learn about animals by pretending to be them. Another visitor commented that, after their last visit, they created an undersea mural at home.

Since the museum is located on the coast, it is no surprise that 20% of visitors were inspired to go to the beach to explore tide pools, watch seals and collect shells. One family, after viewing the Sands Around the Bay display planned to visit Angel Island so they could compare the different sands found there. One mother, seeing her child’s interest in Wave Workshop, decided it was time to take her son to the City of Children, a children’s museum with a water theme in her hometown of Genoa.

**TABLE 13: OTHER IDEAS**

Home	Beach	Aquarium	Museums	Kites, wind	TOTAL
22	20	6	4	3	55

**Question 8: Is there anything else you would like to tell us about Wave Workshop?**

Most answers were generally positive comments about Wave Workshop and the museum such as one grandmother’s comment:

*“I say to my husband every time we come down here that I wish there was something like this place in Seattle. I love this place.”*

One member had only visited Wave Workshop right after it had opened. She hadn’t returned because “it seemed so bare” and she wasn’t sure what she was should teach her kids. She said she saw a “huge improvement” and intended to put it on the itinerary whenever they visited.

**TABLE 14: COMMENTS – POSITIVE**

Love it	Good Design	Educational	Components	TOTAL
35	7	5	4	51

Rather than negative comments, most adults asked for more explanation of the components and how they work. One grandparent from Philadelphia commented that her grandchild did not live by the sea and had never seen a buoy, requiring some explanation of its function. Adults also wanted more things that could be touched or more fish to be viewed. Note that another, larger aquarium with a rocky habitat is scheduled to be installed in the next few months.

**TABLE 15: OTHER COMMENTS**

Explanation	More to touch	Other	Too Young	TOTAL
7	4	4	3	18

### **Behavioral Observations**

Wave Workshop is a very interactive space filled with components and tools that encourage visitors to play as well as to observe and investigate how and why things happen. The following section is based on observations of 30 children who visited Wave Workshop in May 2007. Twenty boys and ten girls were observed. The average age was 4 years. The average time spent in Wave Workshop by the children in this sample, was 15 minutes and 44 seconds during which an average of 8 components (35%) were visited.

While visiting Wave Workshop, children hone their observational skills. At the Sand Table, for example, they name the various birds and animals as they play with the puppets and plush. One little girl related the names of all the puppets and stuffed animals to another child who happened to walk by. After naming them, she turned to the child's mother and held up the hermit crab puppet and said, "Some of these are puppets" and showed her how to manipulate it. At the aquarium, parents and children match the fish to their photos and discuss how flat fish change as they grow. They also observe various phenomena at the components. "Try," said one six-year-old girl to another, "to make big waves." As she sat at the wave breaking point, she observed, "Wow, it is so cool," as she made the gesture of a wave while it moved past her. She then turned to her parent and asked, "What makes the waves?" These are examples of opportunities for children to learn about science and the environment.

As proved true throughout the Museum, children are attracted to water and water features. Eighty percent played at the racing table, the most popular component. They learned how to use the mechanisms that operate the pulleys and how to set and release the brakes. Younger children followed what older children were doing or were helped by an adult, especially with the brake. While parents encouraged them to release their brakes simultaneously, in order to see which shape was fastest, most children pronounced that they had won the race no matter the outcome. There were some creative interpretations of the activity at the Racing Table. Rather than racing to the far end, two girls were racing to see who could rewind her line the fastest. The first prop to return to the starting point was the winner.

Both children and adults used their imaginations to pretend to be creatures living near or under the sea. A child and her parent had a long sequence of imaginative play. While dressed in a crab costume, her father who was manipulating a bat ray puppet chased her. As her father tried on many of the puppets, settling on a shark, she changed into the School of Fish Cape. Together they swam in the Green Screen area, trying to elude a shark that appeared on the monitor. Later, she and a friend, dressed in seal costumes begged the father not to eat them. One parent who greatly enjoyed the costumes and Green Screen was disappointed when her son announced that he wanted to go outside. She wasn't finished playing but dutifully agreed to leave.

**TABLE 16: BEHAVIOR AT WAVE WORKSHOP**

<b>Behavioral Codes:</b>	<b># of Times Noted</b>	<b>Average # of Times per child</b>
Individual Play	225	7.5
Child-Child Interaction	71	2.37
Caregiver-Child Interaction	144	4.8
Staff-Child Interaction	10	.33
Observing/Identifying	245	8.17
Using Tools	149	4.97
Wearing Costumes	45	1.5
Natural Science Pretend Play	44	1.47
Comparing/Sorting	9	.3
Experimenting	1	.03
Creative/Divergent Use	6	.2
Local References	1	.03
Discuss Previous or Other Experience	1	.03

**Summary**

Wave Workshop was designed with very ambitious goals regarding audience and content. Comprised of three adjoining rooms, Under the Waves, Wave Workshop and Toddler Beach, it was intended as a mixed-age space. The first two rooms were designed for 4 to 8 year-olds while Toddler Beach was targeted for younger visitors. The middle room, Wave Workshop, was specifically designed for guided, school group visits by kindergarten through third graders. Due to funding cuts, this program was never developed. Most of the year, the audience is pre-schoolers with an average age of 3 ½ years.

In light of the fact that the audience is so much younger than expected, the content goals were too complex. Wave Workshop, in particular, was intended to acquaint visitors with organisms' structural adaptations to local wind and water currents. Originally, the plan was to have science-based content themes that changed quarterly. Due to staffing restrictions, this too was not implemented. Expectations have had to be adjusted to fit the age group that is using Wave Workshop. Despite the change in audience, Wave Workshop is successful in reaching its preschool audience in some of the same ways that Tot Spot works for this audience.

The majority of adult visitors correctly perceived that the Wave Workshop exhibit is about waves, water currents, and the ocean or bay. Parents gave the exhibit high ratings both for their own enjoyment and for their child's. However, a third of the parents (37%) did indicate that they believed their child was too young for the exhibit.

Almost all of the parents and caregivers thought there were activities that helped their child to learn about science and nature when using the exhibit components. Wave Workshop offers many opportunities for children to learn about science and the

environment and to hone their observational skills. Both children and adults used their imaginations to pretend to be creatures living near or under the sea.

In addition, the adults saw that the children were able to develop or stretch their physical or social skills. For example, they developed their fine motor skills while manipulating interactive elements of the components and gross motor skills while dancing in front of the Green Screen. Also, children developed their social skills by sharing, taking turns, and making new friends.

Wave Workshop stimulated ideas for activities for the families to do after leaving the museum. Visitors were even inspired to go to the beach to explore tide pools, watch seals and collect shells.

Thus, while the Museum may not have succeeded in its original intent to attract an older audience to the exhibit, Wave Workshop is successful in reaching younger children with valuable learning activities relating to science and nature and the development of age-appropriate skills.

**Lookout Cove Summative Evaluation**  
Prepared by Minda Borun and Rose Kelly  
September 2006

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### **Introduction**

The Bay Area Discovery Museum is dramatically situated near the base of the Golden Gate Bridge. Lookout Cove is one of three new exhibitions, themed to “My Place by the Bay”, that feature references to the local animals, habitats, ships, and bridge of the nearby San Francisco Bay. Lookout Cove is a richly compelling and evocative outdoor environment that combines landscape features and constructed displays into an adventure playscape in which children are stimulated to develop their own narratives and to join with others to act out imaginative situations. Many of the most popular areas are archetypes of childhood adventure fantasy such as shipwrecks, caves, huts, and digs. Areas include: a fishing vessel, tide pools, shipwreck dig with buried “treasure”, a bridge under construction, a crow’s nest, a sea cave, and a hut made of willows. In all, there are twenty-five distinct exhibit structures in this 30,000 square foot assemblage of microenvironments and landscape.

### **Children’s Narratives**

A unique and unusual feature of Lookout Cove is the way the distinct areas of this extensive outdoor learning space inspire imaginative social play. As Tom Rockwell, Director of Programs at San Francisco’s Exploratorium observed on a recent visit, the site affords the enacting of archetypal narratives. The activity settings spark dramas, which often feature protagonists such as the hero, explorer, noble worker, or even wild animal. Children create narratives that are suggested by the strong sense of place in the various components of Lookout Cove. In the Shipwreck and the Crow’s Nest there are pirates. In the Fishing Boat are valiant sailors. Explorers populate the Sea Cave and the Stump Trail. Workers are building the Bridge. Children retreat from the world in the Nest and the Maze. The narratives that children create in Lookout Cove reveal a high level of prior knowledge about the natural and built worlds. The social aspect of this behavior is integral to Lookout Cove’s extended dwell times and overall success.

During data collection for behavior coding as part of formative and summative evaluation, children often were observed shouting, acting out life and death scenes and prompting others to join their narratives. Half the children (15 out of 30) verbally identified themselves as a hero in the process of saving others from the dangers of pirates, sharks, enormous waves, whales, military fires, or attacking spiders. About half (16 out of 30) were leaders and explorers looking for treasure or adventure. The Fishing Boat and the Shipwreck particularly elicited these types of multiple person thematic scenes.

About a third of the children (11 out of 30) identified themselves as responsible workers finishing or fixing the Golden Gate Bridge. Their scenes focused on accomplishing important work, articulated as, “I have to fix the bridge” or “we have to take all the rivets off to build the bridge.” A fifth of the children were animals (6 out of 30), acting sometimes as a growling predator in the Willow Maze or a spider in the large Climb-on



Web. In the visitor-built Nests, parents and children acted out animal behaviors. They became birds feeding their young, building a nest or squawking and flapping their wings.

The large outdoor environment of Lookout Cove gives children permission to physically and verbally express themselves in pleasurable ways that are more expansive than in typical indoor environments. Running between components while yelling is a common occurrence. Children also seek refuge and will hide or rest in the smaller enclosed places such as in the Willow Maze, the Giant Redwood, the Sea Cave, and even between the tall plantings in some of the landscaped berms.

### **Goals**

Goals for Lookout Cove were:

- 1) Challenge and delight 5-8 year olds; engage their intellects, imaginations and emotions; involve them in science learning behaviors as well as full body play.
- 2) Create an environment in which families can play and learn together.
- 3) Communicate a connection between Lookout Cove and real local organisms and places.
- 4) Create a place that is beautiful, evocative, inspiring, and engaging and that fosters visitor understanding of and concern for the natural world.

Strategies for achieving these goals involved developing three areas, each of which focuses on a different approach to understanding life at the edge of the Golden Gate:

- 1) *Exploration and Adventure* challenges visitors to use inquiry techniques to investigate a crow's nest, tide pools, a sea cave, and an ancient shipwreck.
- 2) *Design and Building* poses engineering challenges inherent in building bridges, spider webs and even a wood rat's lodge. Key components are a bridge under construction, a gravel pit, spider webs, birds' nests, and a willow structure.
- 3) *Imagination and Expression* invites visitors to absorb the magic of nature and create their own response to it. Key components are: the fishing boat, the artists' pieces (willow construction, stone frog, mosaic, raptors, fish skeleton) and the giant redwood, lookout trail, stump trail, and croaking frogs.

**Summative Evaluation**

This Report summarizes four data sets collected for the summative evaluation of Lookout Cove.<sup>1</sup>

- Tracking and timing of children through the exhibit (N=50 subjects) August and September 2005.
- Sweeps (counting the number of children at each component) (N=64 sweeps)
- Interviews with adults (N=100 subjects) August, September, November 2005.
- Behavioral observations of adult/child groups (N=30 groups) August, September and December 2005 and January 2006.

**Tracking and Timing**

Lookout Cove is approximately 30,000 square feet and includes landscape features. Families spend a long time at Lookout Cove. The average time is nearly half an hour. The longest visit observed was close to 2 hours. Many groups were seen to return later in the day (though once they left the area, the timing ended). Most families engaged with an average of 7 (28%) out of the 25 components available.

**TABLE 1: TRACKING SUMMARY (N=50)**

	<b>Average</b>	<b>Range</b>
Time in Exhibit	28 minutes	4 minutes. to 1 hour 53 minutes
Number of components visited	7 (28%)	1 to 19

**TABLE 2: DEMOGRAPHICS of TRACKING SAMPLE**

	<b>Number</b>	<b>Percent</b>
Boys	23	46
Girls	27	54
Totals	50	100

Average age of children: 5.39 years. Children observed were 4 years old or older.

<sup>1</sup> Data was collected primarily by Rose Kelly and Mary Kidwell.

**Holding Power**

The experiences at which children spend the most time are the Bonnie Fishing Boat/Gangplank, the Tide Pools and the Sunken Digs. Visitors spend almost three times as long at the Bonnie as at the next most visited component.

One 5 and 1/2 year old boy's experience provides an example of the Bonnie's appeal. Steering the boat, he yelled:

*"Pirate ship at 3 degrees. Keep going that way – he'll be tofu. We have to keep going that way. It is at 99 parallels. Send more missiles."*

Then he ran up to roof:

*"Get up - or we're all going to be dead in 3 minutes. We'll all be tofu." He convinced a little girl to crouch down on the roof so they wouldn't die. "Send the missiles at the whale."*

As he ran off the boat, he yelled:

*"I survived!"*

**TABLE 3: TIME AT COMPONENTS**

Mean and Range of Time (seconds) spent at each Component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Range</b>
1	2	Bonnie/Gangplank	423.8	14-2416
2	4	Tide Pools	144.9	6-1657
3	9	Sunken Digs	120.0	11-1892
4	6	Bridge	86.1	8-1892
5	12	Gravel Pit	80.5	35-1640
6	3	Crow's Nest	77.8	3-521
7	5	Inside Sea Cave	73.7	5-1852
8	19	Willow Structure	72.9	24-768
9	11	Back of Ship	38.9	7-214
10	22	Nests	33.5	20-570
11	1	Mechanical fish	23.5	10-214
12	10	Raised Digs	22.4	5-228
13	17	Climb-on Web	17.9	10-195
14	18	Giant Redwood	17.2	3-154
15	8	Front of Ship	17.0	8-267
16	14	Stump Trail	16.8	14-144
17	21	Croaking Frogs	13.5	37-148
18	16	Plexi Webs	13.1	24-187
19	15	Magnetic Web	9.0	3-101
20	23	Mosaic	7.2	61-201
21	7	Front Platforms	6.9	27-142
22	20	Stone Frog	6.5	6-218
23	24	Back Platform	5.3	14-130
24	25	Stick Forts	1.6	82
25	13	Raptors	0	0

**Repeat Visits**

Children tend to make multiple stops at components as they explore the area. The most popular components are the Bonnie/Gangplank, the Tide Pools and the Sunken Digs.

**TABLE 4: STOPS AT COMPONENTS**

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Total Stops</b>	<b>Avg. Stops/child</b>	<b>% children interacting</b>
1	2	Bonnie/G-plank	82	1.6	86%
2	9	Sunken Digs	59	1.2	44%
3	4	Tide Pools	55	1.1	70%
4	3	Crow's Nest	43	0.9	68%
5	19	Willow Structure	41	0.8	46%
6	5	Inside Sea Cave	37	0.7	56%
7	11	Back of Ship	34	0.7	42%
8	1	Mechanical Fish	32	0.6	52%
9	6	Bridge	30	0.6	38%
10	14	Stump Trail	25	0.5	28%
11	10	Raised Dig	22	0.4	28%
12	12	Gravel Pit	20	0.4	24%
13	18	Giant Redwood	20	0.4	26%
14	17	Climb-on Web	19	0.4	30%
15	21	Croaking Frogs	16	0.3	22%
16	8	Front of Ship	15	0.3	22%
17	22	Nests	15	0.3	24%
18	16	Plexi Webs	13	0.3	22%
19	15	Canoe	12	0.2	20%
20	7	Front Platforms	7	0.1	14%
21	20	Stone Frog	7	0.1	14%
22	23	Mosaic	4	0.1	6%
23	24	Back Platform	4	0.1	6%
24	25	Stick Forts	1	0.02	2%
25	13	Raptors	0	0	0%

### Sweeps

Tracking and timing tell us which components people visited and how long they stayed i.e. the relative “dwell time” or “holding power” of the different components. Sweeps on the other hand, count the number of people at each component at a point in time. Sweeps give us a measure of the relative “attracting power” of the different exhibit components. There were 64 sweeps of Lookout Cove totaling 3,295 visitors.

From the sweeps, we see again that the most popular components are the Bonnie/Gangplank, the Tide Pools and the Sunken Digs. Also popular are the Crow’s Nest, the Willow Structure and the Sea Cave, which received roughly the same number of total stops.

**TABLE 5: SWEEPS**  
Number and percent of visitors observed at each component

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Number</b>	<b>Percent</b>
1	2	Bonnie/G-plank	581	17.633%
2	12	Gravel Pit	545	16.540%
3	4	Tide Pools	401	12.170%
4	6	Bridge	240	7.284%
5	19	Willow Structure	213	6.464%
6	9	Sunken Digs	212	6.434%
7	3	Crow's Nest	148	4.492%
8	5	Inside Sea Cave	138	4.188%
9	15	Canoe	101	3.065%
10	11	Back of Ship	81	2.458%
11	17	Climb-on Web	71	2.155%
12	22	Nests	71	2.155%
13	21	Croaking Frogs	68	2.064%
14	8	Front of Ship	56	1.700%
15	18	Giant Redwood	53	1.608%
16	14	Stump Trail	52	1.578%
17	23	Mosaic	45	1.366%
18	1	Mechanical Fish	42	1.275%
19	7	Front Platforms	37	1.123%
20	24	Back Platform	36	1.093%
21	16	Plexi Webs	34	1.032%
22	25	Stick Forts	32	0.971%
23	10	Raised Dig	17	0.516%
24	20	Stone Frog	16	0.486%
25	13	Raptors	5	0.152%
			3295	100.000%

**Score**

If we multiply the average holding power of each component by the percent of visitors (from the sweeps table) that stopped at the component, we get a combined measure of attracting and holding power or “score.” Here the scores are consistent with the tracking and timing and the sweeps data. The Bonnie/Gangplank, the Tide Pools and the Sunken Digs have the highest scores. The Crow’s Nest, Sea Cave, Willow Structure and Bridge also have high scores. The Raptors activity is very brief and is captured in the sweeps and adult interviews but not in the score.

**TABLE 6: SCORE**  
Mean time (seconds) multiplied by the percent of visitors

<b>Rank</b>	<b>Map #</b>	<b>Exhibit Component</b>	<b>Mean</b>	<b>Percent</b>	<b>Score</b>
1	2	Bonnie/G-plank	423.82	86%	364.49
2	4	Tide Pools	144.92	70%	101.44
3	9	Sunken Digs	120.40	44%	52.98
4	3	Crow's Nest	77.82	68%	52.92
5	5	Inside Sea Cave	73.74	56%	41.29
6	19	Willow Structure	72.92	46%	33.54
7	6	Bridge	86.14	38%	32.73
8	12	Gravel Pit	80.50	24%	19.32
9	11	Back of Ship	38.94	42%	16.35
10	1	Mechanical Fish	23.54	52%	12.24
11	22	Nests	33.5	24%	8.04
12	10	Raised Dig	22.4	28%	6.272
13	17	Climb-on Web	17.92	30%	5.38
14	14	Stump Trail	16.84	28%	4.72
15	18	Giant Redwood	17.2	26%	4.47
16	8	Front of Ship	16.96	22%	3.73
17	21	Croaking Frogs	13.54	22%	2.98
18	16	Plexi Webs	13.12	22%	2.89
19	15	Canoe	9.02	20%	1.80
20	7	Front Platforms	6.88	14%	0.96
21	20	Stone Frog	6.5	14%	0.91
22	23	Mosaic	7.18	6%	0.43
23	24	Back Platform	5.3	6%	0.32
24	25	Stick Forts	1.64	2%	0.03
25	13	Raptors	0	0%	0

**Exit Interviews**

Interviews were conducted with 100 adults (parents and caregivers) upon leaving the exhibit area of Lookout Cove in August, September and November 2005

**TABLE 7: DEMOGRAPHIC INFORMATION ABOUT THE ADULTS INTERVIEWED**

	<b>Totals</b>		
Interviews	100		
Males	37		
Females	63		
Average number of adults per group	1.94		
Average number of children per group	2.07		
		<b>Members</b>	<b>Non-Members</b>
First time visitors	32	5%	27%
Visited 2 – 5 times	31	8%	23%
Visited 6 – 10 times	17	13%	4%
Visited More than 10 times	20	17%	3%
BADM members	42		

**Question 1: We were just wondering how people perceive this area. There are no right or wrong answers. What would you say this area is about?** (Some responded to more than one category.)

The most frequent response to this question (seventy-nine respondents) identified the content as generally ocean or maritime. Close to half of the respondents said it was about exploration, discovery and using one’s imagination. The same number identified local references including the California Coast, the Golden Gate Bridge and the San Francisco Bay. As one perceptive parent commented:

*“There’s a San Francisco theme with treasure and boats and the bridge. It’s a coastal theme and a ship theme. Here you discover things. They don’t hit you over the head with signage or make things obvious. You get to discover them as they unfold.”*

A third of the respondents talked about nature, including animals and plants as well as natural history. A similarly sized group described historical events such as pirates and shipwrecks. A quarter thought it was a safe place designed for kids that provided a hands-on, rich environment. Ten respondents thought it was about construction and building nests. A few respondents recognized that there were “access points for different ages, and grown-ups too.”

The sample size for adult interviews was 100, making the percent equal to the number of people who chose a response.

**TABLE 8a: WHAT IS THE AREA ABOUT?**

	<b>Percent</b>
<b>Generally Ocean/ Water/ Nautical/ Maritime/ Boats/ Bridge-oriented</b>	<b>79%</b>
Explore/ Discovery/ Imagination	43%
Local References: the California Coast/ San Francisco/ the Golden Gate Bridge/ the Bay/ San Francisco Bay/ Tomales Bay	40%
Nature/ Animals/ Plants/Natural History/Geography	35%
History/ Culture/ Pirates/ Shipwreck/ Tiki	32%
Place for kids/ Age appropriate/ Hands-on/ Rich Environments	17%
Construction/ Building nests and forts	11%
Outdoors	8%
Real/ Fake Perceptions	4%
For Grown-ups too/Aesthetics/ Recreation	4%
Secure/ Safety	3%

**TABLE 8b:MEMBER VERSUS NON-MEMBER PERCEPTION**

	<b>Ocean</b>	<b>Explore</b>	<b>Local</b>	<b>Nature</b>	<b>Building</b>
Member	34%	18%	18%	17%	5%
Non-member	45%	25%	22%	18%	6%
Total	79%	43%	40%	35%	11%

**TABLE 8c: PERCEPTION OF FREQUENT VISITORS**

(37 visitors, 29 members and 8 non-members, had visited over 6 times)

	<b>Ocean</b>	<b>Explore</b>	<b>Local</b>	<b>Nature</b>	<b>Building</b>
Member (29)	25	13	13	12	4
Non-member (8)	6	5	2	2	0
Total	31	18	15	14	4
Percent	84%	49%	41%	38%	11%

**Question 2: On a scale from 1 to 5, with 5 being the highest, how do you think your child would rate his/her level of enjoyment for this area?**

Parents rated their child’s average level of enjoyment 4.62 on a 5-point scale.

**Why would you rate it this way? (Some responded to more than one category)**

Five categories received close scores, for this rating. A quarter of the respondents described how much their child loved Lookout Cove. One 7 year old when he found out the upcoming visit to BADM said, "Yippee! Good choice." When he was asked on a scale of 1 to 5 what his level of fun was, he replied a “7”. An equal number identified specific components such as the tidal pools and trucks as their child’s favorite part of the visit. A fifth of the respondents mentioned the variety of activities for different ages.



Physical activity appears to rate higher with Lookout Cove than with most other typical exhibits. A significant number (one third of the respondents) rated physical, outdoor activity as the main reason why their child liked the experience. Nineteen said that their child could “explore and test their abilities.” One parent commented:

*“It incorporates all the senses and their imaginations.”*

Parental perception of the space as being “good” for children was quite high. A few respondents identified themes such as being pirates or birds as most enjoyable. Fifteen respondents did not actually identify a reason, focusing more on the child’s mood or age.

**TABLE 9: REASON FOR RATING (CHILD)**

	Percentage
Affect/ Love/ Excited/ Great	26%
Specific components such as the tidal pools/ water and trucks	24%
Lots to do/ lots of areas/ variety/ different activities for different ages	20%
Physical activities such as running and climbing	20%
Exploring/ discovery/ imagination/ building/ challenges	19%
Other	15%
Hands-on/ social/ fun/ child-size	15%
Outdoors/ open space/ nature	9%
Themes/ subject matter such as pirates/ treasure/ boats/ being birds	4%
Adventure/ safety issues	1%

**Question 3: On a scale from 1 to 5, with 5 being the highest, how would you rate your level of enjoyment?**

The average level of enjoyment was rated 4.72 for adults. Interestingly, adults rated their level of enjoyment slightly higher than their child’s perceived level of enjoyment.

**Why would you rate it this way? (Some responded to more than one category)**

The two responses that were frontrunners for this question were the adult’s own enjoyment and their pleasure in observing the child’s enjoyment:

*“It is fun when you know you don’t have to be a hawk. You can let them stretch their comfort level and experience things.”*

The setting figured prominently in parents’ positive ratings with almost half of the respondents either identifying the natural beauty of the location or mentioning the great weather. In the words of parents:

*“This is the most pretty and spacious area of all the children’s museums we’ve been to, including the other outdoor areas, and we’ve been to a lot of them.”*

*“It’s about discovery. I like that kids have to discover things for themselves, it’s not just laid out- no flashing lights, a NATURAL discovery, I would say.”*

*“It’s a 10! There are lots of choices, it is child directed, tactile and spacious.”*

*“It's key for me that it's nature-based. If it were big plastic things I'd really hate it.”*

A significant number did complain that the lack of benches negatively affected their level of enjoyment. On the other hand, safety and being able to interact with their child were also cited as positives. One 5 year old said that his favorite thing was "making new friends like Erin."

**TABLE 10: REASON FOR RATING (ADULT)**

	<b>Percentage</b>
<b>Own enjoyment/ Relaxing</b>	<b>42%</b>
<b>Child's enjoyment/ Good for child</b>	<b>31%</b>
Aesthetics/ Natural/ View/ Location	25%
Outdoors/ Sunshine	18%
Other (no benches)	12%
Interaction with child	9%
Good for watching child/ Safety	8%

**Question 4: This is a very large exhibit – here’s a map of it. I’d like you to circle on the map the places you went.**

Table 5 indicates how many groups visited each component and how many ranked it as one of their favorites. Groups could have more than one favorite.

The Bonnie fishing boat was the most visited component and, by far, the most popular. Sixty-one percent of respondents who visited it, voted it their child’s favorite. The next most popular was the Willow Structure. One family said:

*“We all love the willow thicket. We play hide and go seek and the three little pigs and other games inside.”*

The Tide Pools, Gravel Pit and Bridge were also rated as favorites by a quarter of the visitors. Often, each family member had a personal favorite. For example, in one family the 2 year-old wanted to spend his visit climbing and jumping off concrete benches around the mosaic. The mechanical fish was Dad's favorite. The reed house was the mom's and the uncle admired the stump trail. Many visitors never ventured to the back of the 30,000 square foot site. This was due, in a large part, to the popularity of the Bonnie, the Gravel Pit and the Bridge, which are all located towards the front of Lookout Cove.

**TABLE 11a: COMPONENTS MOST VISITED/  
FAVORTIE COMPONENTS.**

<b>Component</b>	<b>Visited</b>	<b>Favorite</b>
Bonnie	81%	61%
Tide Pools	73%	28%
Willow Structure	58%	43%
Crow’s Nest	58%	12%
Sunken Digs	54%	14%
Sea Cave	53%	17%
Gravel Pit	51%	26%
Bridge	50%	21%
Stump Trail	37%	4%
Climb-on Web	37%	1%
Raise Digs	36%	9%
Back Platform	36%	12%
Mechanical Fish	30%	8%
Croaking Frogs	28%	4%
Giant Redwood	25%	0%
Mosaic	25%	7%
Back of Ship	24%	1%
Nests	23%	4%
Front of Ship	23%	3%
Canoe	17%	1%
Front Platform	11%	2%
Plexi Webs	11%	3%
Stone Frog	7%	0%
Raptors	4%	0%
Stick Forts (not available all of the time)	1%	1%

**Question 5: Were there activities here that you think helped your child to learn something or stretch their physical or social skills?** (Some responded to more than one category)

Half of the parents and caregivers did perceive that the activities helped their child to develop or stretch skills. Over half thought that a visit to Lookout Cove stretched the child’s physical skills especially through climbing and balancing:

*“Last time she climbed the stump trail but it was hard. She whooshed up it this time. She is becoming independent in this familiar place. The space grows with her, like a roadrunner cartoon. You get it on different levels each time. It’s always a good visit -- interacting at different levels every visit.”*

Half of the respondents thought that Lookout Cove stretched academic skills by encouraging imaginative play and presenting the natural world. One parent, whose child attends a pre-school that focuses on individual learning styles and experimentation, explained:

*“A lot of stuff here is educational. It’s about figuring out how things work or why things are the way they are.”*

Just under half of those interviewed thought that Lookout Cove stretched social skills by presenting situations where children:

*“learn to take turns, be patient, to share with other children and to make friends with new children.”*

*“They learn to play with other kids. Since they live in the City, they don't get a chance to play with kids. So they come here to learn how to socialize with kids of different ages and nationalities.”*

**TABLE 11b: ACTIVITIES THAT DEVELOPED SKILLS**

<b>Activity</b>	<b>Percentage</b>
<b>Academic</b>	<b>50%</b>
Using component	12
Exploring, observing, using imagination	17
Science/ Natural Science	17
Learning from others	1
History	4
Figuring things out	8
<b>Physical</b>	<b>56%</b>
Climbing/ Running	28
Coordination/ Balance/ Physical Challenges	25
Building/ Shoveling	6
Exploring	2
<b>Social</b>	<b>48%</b>
Taking turns/ sharing/ developing good manners	24
Making friends	26
Awareness of others	4
Adult/child interaction	1
Becoming independent	3

**Question 6: Did you notice any signs in Lookout Cove that explained any of the exhibits?**

There were a total of 10 signs in Lookout Cove. Slightly more than half the respondents (52%) read some of the signs while 11% noticed the signs but didn’t actually read them. The description of the Shipwreck and the explanation of how the Willow Structure (maze) was built were of most interest to respondents.

**TABLE 12: VISITORS WHO READ SIGNS**

Entry	Posts	Fish	Pool	Wreck	Maze	Frog	Mosaic	Donor	Bridge
4	4	3	8	20	19	3	11	2	3
8%	8%	7%	15%	<b>38%</b>	<b>37%</b>	7%	21%	4%	7%

**Question 7: Did the exhibit spark any ideas for other activities to do with your children outside the museum?**

Over half of the respondents (56%) answered that the exhibit had sparked ideas for activities to do after their visit. Seventeen (17%) said that they would return to BADM. Other activities included getting out in nature especially visiting a real tide pool; going on a real boat; or organizing things to do at home such as pretend play activities. A parent, inspired by the visit, thought:

*“Maybe we could make bird nests or fairy houses at home.”*

*“We just bought a house and we were talking about ways to put things together in the back yard so she'll have things to discover.”*

Ten percent of respondents felt that the BADM experience related to their interest in cultural institutions such as visiting a museum or aquarium.

**TABLE 13: OTHER IDEAS**

Tide pools	BADM	Home	Interests	Boats	TOTAL
19	17	17	10	4	<b>67</b>

**Question 8: Is there anything else you would like to tell us about Lookout Cove?**

Most answers were positive comments about Lookout Cove such as:

*“We love it!”*

The variety of components, excellent design and feeling of safety were all commented on by respondents. One grandfather, visiting from Germany said:

*“Lookout Cove is marvelous. There is no place like this in all of Germany!”*

Negative comments focused on missing or broken props/components and the lack of adequate seating.

**TABLE 14: OTHER COMMENTS – POSITIVE**

Love it	Variety	Outdoor	Design	Return	Fun	Safety	TOTAL
<b>30</b>	9	6	6	4	4	4	<b>63</b>

**TABLE 15: OTHER COMMENTS – NEGATIVE**

Broken	Seating	Price	Safety	Other	TOTAL
<b>10</b>	6	4	1	7	<b>28</b>

### **Behavioral Observations**

The following section is based on observations of 30 children in Lookout Cove. Seventeen boys and thirteen girls over the age of 4 were observed. The average age was 5 1/2. The average time spent at Lookout Cove was 31 minutes during which an average of 10 components was visited. Of the 30 observations, 19 included visits to both the front and back areas of Lookout Cove.

The behavior of children shows that the exhibits elicited frequent instances of imaginative play. This was especially evident in the Bonnie where the children fought against pirates and braved storms at sea. One very windy and misty day a four-year old girl warned, "It's going to happen – a blizzard. There's going to be a storm. I'm not joking." She then herded all hands below deck, telling them, "Everything is breaking for no reason. There's no way to turn around." The children began running around the boat chanting: "There's another boat!" She called to her mom, "Let's stop at the next island. I need to get the bubble gum but there's no grocery store." Turning to the children, she said, "I got bubblegum, wax and an old shoe."

Children also observed and identified the exhibit elements especially the various forms of marine life. One child referred to the croaking frogs as "the frog research area." They used tools to dig for buried treasure and to transport gravel. Inside of the sea cave, the Pepper's Ghost elicited responses such as "Look. It's magic!" Building a nest frequently led to pretend play, cheeping like a baby bird. In addition, there was a good deal of interaction between children and between parents and their children.

Rules used in coding are listed in the Lookout Code Behavioral Coding Definitions.

**TABLE 16: BEHAVIOR AT LOOKOUT COVE**

<b>Behavioral Codes:</b>	<b># of Times Noted</b>	<b>Average # of Times per child</b>
Pretend Play	130	4.5
Observing	76	2.5
Using Tools	70	2.3
Building or Taking Apart	16	.53
Comparing and Sorting	11	.37
Experimenting	9	.3
Creative/Divergent Use	9	.3
Discuss Previous or Other Experience	6	.2
Local References	6	.2

## **Summary**

The dramatic areas of Lookout Cove have tremendous holding power. Families spend a long time at Lookout Cove, with an average time of nearly half an hour. While they tend to visit only 28% of the available features during a single visit, this can be taken as a further indication of the holding power of the microenvironments within the 30,000 square feet of Lookout Cove. Lookout Cove is a space to be revisited many times not something to be “done” in one day. It is an area in which children play, explore and develop their own narratives rather than surveying the environment as a museum space. Children tend to make multiple stops at components as they explore the area and, in the relatively short time that the Cove has been open, 20% of the visitors have visited more than ten times.

When asked what Lookout Cove is about, seventy-nine percent of the respondents identified the content as generally ocean or maritime. In addition, close to half of the respondents thought that the space is about exploration, discovery and using one’s imagination. These are all explicit goals for Lookout Cove.

Adults gave Lookout Cove extremely high ratings on a five-point scale, both from their child’s point of view (4.62) and their own (4.72). Interestingly, adults rated their own level of enjoyment slightly higher than their child’s perceived level of enjoyment. These scores are unusually high and reflect the adult’s own enjoyment as well as their pleasure in observing the child’s activity and involvement. Adults also mentioned appreciating the fact that they were able to interact with their child. This was also an explicit goal of the project.

Behavioral observation showed that the exhibit elicited many instances of pretend play. While engaged in these narratives, children also exhibited examples of science learning including: identifying and comparing various forms of marine life and other creatures that inhabit the area around the bay and using tools to dig for treasure and to transport gravel. Another goal was to help children develop or stretch their physical, academic, and social skills. Parents were able to list specific skills that were enhanced by their child’s activities in Lookout Cove. Over half of the respondents (56%) indicated that the exhibit had sparked other ideas for activities to do after their visit including: visiting natural sites such as tides pools, going on a real boat, and organizing pretend play adventures at home. Finally, when asked for open-ended comments about their experience in Lookout Cove, most answers were extremely positive, the most frequent being “We love it.”