

# CURRENT SCIENCE

Timing and Tracking Study  
 Findings and Analysis  
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## PROFILE OF THE SAMPLE

TOTAL		98	
SEX:	Male	49	50%
	Female	49	50%
AGE:	Kids 12 & under*	50	51%
	Adults 20& over	48	49%

\* There were three teenagers in the sample, one each aged 14, 15 and 16.

Sex and age:

	<i>Kids</i>		<i>Adults</i>		<i>TOTAL</i>	
	N	%	n	%	n	%
M	27	28%	22	22%	49	50%
F	23	24%	26	27%	49	50%
<b>TOTAL</b>	<b>50</b>	<b>51%</b>	<b>48</b>	<b>49%</b>	<b>98</b>	<b>100%</b>

No single age, or even decade, had enough subjects to make a big enough group to study. And they were pretty evenly spread out – except for a big gap in the teen years. Which made for this very nice split. However, none of these four groups is big enough to allow for comparisons, unless we allow for really wide margins of error. So we won't be doing too much comparison of boy vs. girl, or girl vs. woman.

Group: Family	70	71%
Adults	19	19%
Large	3	3%
Other	1	1%
Don't know	5	5%
TOTAL	98	100%

NOTE: Again, other than Family none of the groups are large enough to support any conclusions, so I will disregard Group in my analysis.

OVERALL EXHIBIT USE

	<i>N</i>	<i>Stops</i>	<i>Tot. time (seconds)</i>	<i>Stops/vis.</i>	<i>Time/vis. mean</i>	<i>Time/vis. median</i>
<b>TOTAL</b>	<b>98</b>	<b>194</b>	<b>27,364</b>	<b>2.0</b>	<b>04:39</b>	<b>3:35</b>
Male	49	100	12,959	2.0	04:25	2:41
Female	49	94	14,405	1.9	04:54	2:49
19-under	50	101	15,049	2.0	05:01	4:05
20-over	48	93	12,315	1.9	04:17	2:34
Boy	27	58	7,529	2.1	04:39	3:40
Girl	23	43	7,520	1.9	05:27	4:14
Man	22	42	5,430	1.9	04:07	1:58
Woman	26	51	6,885	2.0	04:25	2:52

**Analysis:** Jeff isn't going to like the averages – they are less meaningful than ranges and distributions. However, it is worth noting that no matter how you slice it, all visitors made an average of about 2 stops. No differences by age or gender.

The average of total time spent in the exhibit shows that females (of any age) spend somewhat more time in the exhibit than males; and young visitors spend a good deal more time than adults. Breaking it down further we see that girls *appear* to spend a good deal more time in the exhibit than anyone else. However – and this is where the small sample size starts to hurt us – one girl spent a full *20 minutes* on the website. Take her out, and girls average 4:45 – still more, but only slightly, and perhaps not significantly. This one subject may also account for some of the other discrepancies.

## STOPS MADE

Used only 1 component	49	50%
2 components	22	22%
3 comp.	14	14%
4 comp.	8	8%
5 comp.	3	3%
6 comp.	2	2%
<b>TOTAL</b>	<b>98</b>	<b>100%</b>

**Analysis:** This makes a pretty nice decay curve: 1/2 of our visitors made one stop, 1/4 made two; 1/8 made three; 1/16 make four; 1/32 made five. No, it's not perfect, but it's close. (There's a decay curve coming up later that is almost *spot-on* perfect.)

What it tells us is half of our visitors only make one stop; about three-quarters only make one or two; less than 15% make four or more. Maybe we don't need so many components?

## PEOPLE MAKING ONLY ONE STOP

	<i>N</i>	%
<b>TOTAL</b>	<b>49</b>	<b>50%</b>
<b>MALE</b>	<b>22</b>	<b>45%</b>
19-under	11	41%
20-over	11	50%
<b>FEMALE</b>	<b>27</b>	<b>55%</b>
19-under	11	48%
20-over	16	62%
<b>19-UNDER</b>	<b>22</b>	<b>44%</b>
boys	11	41%
girls	11	50%
<b>20-OVER</b>	<b>27</b>	<b>56%</b>
men	11	50%
women	16	62%

**Analysis:** All of these sub-groups are pretty small, and the differences are not large enough to be significant. But, if they were to hold true in a larger sample, we would see adults seeming more likely than kids to make one stop and leave (no surprise there).

So, the challenge for developers is: how do we get adults to slow down and do more? The answer, coming up later, is...panels?

WHAT DID THEY SEE ON THEIR FIRST STOP? (all visitors)

	<i>N</i>	<i>%</i>	<i>B</i>	<i>G</i>	<i>M</i>	<i>W</i>
NEWSCAST	47	48%	16	16	6	9
QUIZ SHOW	21	21%	6	5	4	6
PANELS	18	18%	1	1	8	8
WEBSITE	3	3%	2		1	
ACTIVITY TABLE	2	2%	1		1	
RADIO	2	2%	1		1	
CULTURE PANELS	2	2%				2
NUTRITIONIST	2	2%		1		1
PLASMA SCREEN	1	1%			1	

**Analysis:** This tries to measure what's attractive, what pulls people in. No surprise, news cast is tops. Quiz show is second, and the panels surprisingly are pretty close behind. In addition to being visually stimulating, these components are also on the outside perimeter of the exhibit area.

There are no sex differences among the top three; the others have too few subjects to make any meaningful comparisons.

As for age differences, the newscast was twice as attractive to kids than to adults; the quiz show was evenly attractive among all groups; and the panels, not surprisingly, were almost exclusively attractive to adults.

WHAT DID THEY SEE DURING THEIR FIRST STOP? (visitors making one stop only vs. visitors making multiple stops)

	<i>Made only one stop</i>		<i>Made more than one stop</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
NEWSCAST	25	51%	22	45%
QUIZ SHOW	14	29%	7	14%
PANELS	5	10%	13	27%
OTHERS	5	10%	7	14%

**Analysis:** This compares the first-stop habits of those who only made one stop total, vs. those who went on to see more of the exhibit.

Again, the newscast is tops in both groups, and the difference is fairly small and probably not significant.

Among the 21 people who stopped at the quiz show first, 2/3rds left without seeing anything else. This is probably due to its placement (very easy to get up and leave, or to just cruise by briefly), and the fact that it takes a long time (by the time you're done doing a quiz, you've had your fill of the topic).

Panels is very interesting. The 18 people who started at the panels were pretty likely to go on to see something else in the exhibit. And we know from previous charts that visitors who start at the panels are almost exclusively adults. *And* we know that adults are more likely to make one stop and then leave.

The sample size is small, but adults who start with the panels are a LOT more likely to go on to other components than adults who start elsewhere (69% to 49%). Is it because the panels are a compelling hook? Or is it because visitors with a predisposition to read intro labels are more likely to be thorough?

HOW LONG DID THEY STAY IN THE EXHIBIT?

	<i>N</i>	<i>CUM</i>
0:01 – 1:00	15	15
1:01 – 2:00	16	31
2:01 – 3:00	17	48
3:01 – 4:00	8	57
4:01 – 5:00	9	65
5:01 – 6:00	7	74
0:01 – 3:00	48	48
3:01 – 6:00	24	74
6:01 – 9:00	11	85
9:01 – 12:00	6	91
12:01 – 15:00	2	93
15:01 – 18:00	2	95
18:01 and up	3	98

Fastest 25% 0:01 – 1:30  
 Fastest 50% 0:01 – 3:30  
 Fastest 75% 0:01 – 6:00

**Analysis:** This is that perfect decay curve I was telling you about. If you break it into three-minute segments, we find that almost *exactly* 1/2 stay for three minutes or less; almost *exactly* 1/4 stay three to six minutes; 1/8 stay for six to nine minutes (OK, we’re off by one, so sue me); and 1/16 stay for nine to twelve minutes. Then we get that right-tail trailing off.

The top half of the chart shows a minute-by-minute breakdown for the first six minutes (which accounts for 75% of visitors’ total stays). The bottom half of the chart breaks it down by three-minute-increments, to allow comparisons to other charts that do the same.

The three lines above show percentiles: 1/4 of our visitors disappear within a minute-and-a-half; 1/2 of them disappear within three-and-a-half, etc.

The bottom line is, for an exhibit this size, people are spending a LOT of time. In her book *Paying Attention*, Beverly Serrell cites statistics showing that the mean

“speed” of a visitor in a non-diorama science exhibit is about 300 square feet per minute. Our median is 142; our mean is 82. Folks are spending TWO TO THREE TIMES more time in this exhibit than we would expect. Cool!

HOW LONG DID THEY STAY continued...

	<i>MALE</i>		<i>FEMALE</i>		<i>KIDS</i>		<i>ADULTS</i>	
0:01 – 3:00	25	51%	23	47%	21	42%	27	56%
3:01 – 6:00	12	25%	14	29%	15	30%	11	23%
6:01 – 9:00	5	10%	6	12%	7	14%	4	8%
9:01 – 12:00	4	8%	2	4%	4	8%	2	4%
12:01 – 15:00	1	2%	2	4%	1	2%	2	4%
15:01 – 18:00	1	2%	0				1	2%
18:01 and up	1	2%	2	4%	2	4%	1	2%

**Analysis:** The dark line is the six-minute mark.: three-quarters of our visitors stay in the exhibit six minutes or less. And in all the columns, yes, we see roughly 75% log in six minutes or under. There are no significant differences between males and females. Looking at age differences, we see adults are 7 points more likely to bolt in under six minutes; and 14 points more likely to do so in under three. This is not surprising, given that they are also significantly more likely to do just one component and leave.

	<i>BOYS</i>		<i>GIRLS</i>		<i>MEN</i>		<i>WOMEN</i>	
0:01 – 3:00	12	44%	9	39%	13	59%	14	54%
3:01 – 6:00	7	26%	8	35%	5	23%	6	23%
6:01 – 9:00	5	19%	2	9%	0		4	15%
9:01 – 12:00	2	7%	2	9%	2	9%	0	
12:01 – 15:00			1	4%	1	5%	1	4%
15:01 – 18:00					1	5%	0	
18:01 and up	1	4%	1	4%	0		1	4%

**Analysis:** OK, the sample sizes are getting really small here, and I don't think we can say anything with confidence. If there are any differences, they again seem to be age-based.

## USE OF COMPONENTS

<i>COMPONENT</i>	<i>N</i>	<i>%</i>	<i>Total time</i>	<i>% of tot. time</i>	<i>Mean time</i>	<i>Med. time</i>
Newscast	58	59%	7,039	26%	02:01	1:12
Quiz show	39	40%	10,938	40%	04:41	4:08
Panels	24	25%	1,481	5%	01:02	0:43
Radio and board	19	19%	594	2%	00:31	0:27
Website	15	15%	2,761	10%	03:04	0:56
Nutritionist	11	11%	854	3%	01:18	0:58
Activity table	10	10%	1,997	7%	03:20	1:30
Plasma	7	7%	483	2%	01:09	0:25
Post-its	6	6%	317	1%	00:53	0:30
Culture panels	5	5%	105	0%	00:21	0:18

**Analysis:** No big surprises here. In terms of use, the newscast was the single most popular component – almost 60% of all visitors used it at some point during their visit. The quiz show was next at just under 40%, and the panels third at about 25%. Everything else kind of trails off after that.

In terms of time spent, the quiz show had the longest average time spent at 4:41. (In fact, even though the newscast attracted far more users, but they used it on average only half as long, so total time observed at the quiz show was actually a lot higher than for the newscast.) This is not too surprising, given the nature of the quiz show activity.

The panels got a fair amount of use, but the average user was only there for a minute.

A couple small surprises further down the list can be explained by some anomalies. The activity table and the website were second and third in holding power, both with average times over three minutes. However, we had a couple of adult subjects stay quite a long time at the table (three to thirteen minutes), playing with or watching their kids. And, as noted before, there was one web user who logged an amazing *20 minutes* on that one component, totally skewing that average.

The median time on several components is considerably lower than the mean, indicating a small number of lengthy uses pulled the average up.

COMPONENTS BY TYPE OF USE

<i>Component</i>	<i>pf</i>		<i>dw</i>		<i>aw</i>		<i>other</i>		<i>Total</i>	
	n	%	n	%	n	%	n	%	n	%
Newscast	22	29%	17	47%	24	44%	0		63	29%
Quiz show	30	40%	6	17%	7	13%	0			
Panels	2	3%	4	11%	3	6%	20	40%	29	13%
Radio / board	4	5%	2	6%	2	4%	10	20%	18	8%
Website	9	12%	1	3%	5	9%	2	4%	17	8%
Activity table	4	5%	4	11%	3	6%	4	8%	15	7%
Nutritionist	3	4%	2	6%	2	4%	6	12%	13	6%
plasma	0		0		7	13%	0		7	3%
Post-its	1	1%	0		2	4%	3	6%	6	3%
Culture panels	0		0		0		5	10%	5	2%

**Analysis:** I’m not entirely sure how these were defined, so I’m just going to take a guess.

Considering *all* types of activity, the newscast produced the most – some 29% of the total for the entire exhibit. Quiz show was next at 20%, panels third at about 13%. Four other components had some activity – radio, website, activity table, and nutritionist. The rest had just a smattering.

Of course, the best activity is full participation. There, the numbers are different. The quiz show, because of the nature of the activity, created a lot more full participation – 40% of the “pf” observed. The newscast, despite having more users and more total activity, accounted for only 30% of the “pf”; the website, despite very few users, got 12% of the “pf”; and the rest had a smattering.

COMPONENTS BY TALKING

<i>COMPONENT</i>	<i>tac</i>		<i>to</i>		<i>tct</i>		<i>tot. talk</i>	
	n	%	n	%	n	%	n	%
Newscast	23	36%	17	65%	4	29%	44	42%
Quiz show	25	39%	5	19%	2	14%	32	31%
Panels	7	11%	0		0		7	7%
Radio / board	0		0		3	21%	3	3%
Website	3	5%	1	4%	0		4	4%
Activity table	4	6%	3	12%	1	7%	8	8%
Nutritionist	2	3%	0		2	14%	4	4%
Plasma	0		0		1	7%	1	1%
Post-its	0		0		1	7%	1	1%
Culture panels	0		0		0		0	

**Analysis:** We want our components to inspire visitors to talk. Especially, we want to inspire them to talk about the content.

The newscast requires talking, so, no surprise, it accounted for over 42% of all talking observed. The quiz show was a bit over 30%. The panels (a reading activity) and the activity table (a talking activity, but one lightly used) inspired some talking. Everything else had just a smattering.

In terms of talking about the content, the gap between newscast and quiz show closes. In fact, quiz show comes out slightly ahead, though perhaps not significantly. The panels inspired some content discussion. Nothing else contributed much.

## COMPONENTS BY INTERACTIVITY

<i>COMPONENT</i>	<i>CMU</i>		<i>SU</i>	
	n	%	N	%
Newscast	37	41%	10	13%
Quiz show	28	31%	6	8%
Activity table	9	10%	1	1%
Radio / board	4	4%	16	21%
Panels	4	4%	14	18%
Website	4	4%	9	12%
Nutritionist	3	3%	8	10%
Plasma	2	2%	5	7%
Culture panels	0		5	7%
Post-its	0		3	4%

**Analysis:** Cooperative, multiple use is the gold standard we are looking for. And, again, the newscast and quiz show lead the pack with 41% and 31% respectively. The activity table accounted for just under 10%; nothing else did much.

Solitary use, not surprisingly, was concentrated among components that feature reading – something you generally do by yourself.

## USE OF COMPONENTS breakdown

	Activity Table	Culture panels	News	Nutri-tionist	Panel	Plasma	Post-it	Quiz show	Radio	Web
<b>MALE</b>										
#	5	2	29	5	11	5	2	19	13	9
%	10%	4%	59%	10%	22%	10%	4%	39%	27%	18%
Time	436	35	2979	312	715	374	230	6163	407	774
%	3%	0%	23%	2%	6%	3%	2%	48%	3%	6%
<b>FEMALE</b>										
#	5	3	29	6	13	3	3	20	6	6
%	10%	6%	59%	12%	27%	6%	6%	41%	12%	12%
Time	1561	70	4060	542	766	179	65	4775	187	1987
%	10%	1%	28%	4%	5%	1%	1%	33%	1%	13%
<b>KIDS</b>										
#	4		37	4	5	6	2	21	14	8
%	8%		74%	8%	10%	12%	4%	42%	28%	16%
Time	276		5539	192	150	342	147	5549	395	1894
%	2%		37%	1%	1%	2%	1%	37%	3%	13%
<b>ADULTS</b>										
#	6	5	21	7	19	2	3	18	5	7
%	13%	10%	44%	15%	40%	4%	6%	38%	10%	15%
Time	1721	105	1500	662	1331	163	148	5389	199	867
%	13%	1%	12%	5%	10%	1%	1%	42%	2%	7%

**Analysis: Sex-based differences:** almost none. The three most heavily-used components – newscast, quiz show, and panels – had almost exactly the same percentage of males as females using them. Though the sample is small, males seem twice as likely than females to use the radio – in fact, it was slightly more popular with males than the panels were.

In terms of time, females spent a little more time at the newscast than males did. Males spent a LOT more time at the quiz show than females did. (The four longest users, all 10 minutes-plus, were male.) Other components have too few subjects to make meaningful comparisons.

**Age-based differences:** Kids spend 74% of their time, and 67% of their stops, and just two components: newscast and quiz show. (Newscast was clear winner in number of users, but total time spent on the two components was nearly identical.) Nothing else gets much attention at all – except for the website, which has that one outlier skewing results.

Adults spread themselves out a bit more – newscast, quiz and panels all got similar numbers, and account for only 62% of total stops. Quiz show used up far more time than anything else. Four attentive parents boosted the activity table’s share of time, spending 2 to 12 minutes each. (Thanks to them, adults spent WAY more time at the activity table than kids!)

USAGE PATTERNS, THREE MOST POPULAR COMPONENTS

	NEWSCAST				QUIZ SHOW				PANELS			
	#	%	cum	%	#	%	cum	%	#	%	cum	%
0:01-1:00	24	41%	24	41%	4	10%	4	10%	17	71%	17	71%
1:01-2:00	15	26%	39	67%	4	10%	8	21%	4	17%	21	88%
2:01-3:00	8	14%	47	81%	6	15%	14	36%	2	8%	23	96%
3:01-4:00	4	7%	51	88%	4	10%	18	46%	1	4%	24	100%
4:01-5:00	1	2%	52	90%	5	13%	23	59%				
5:01-6:00	4	7%	56	97%	6	15%	29	74%				
6:01+	2	3%	58	100%	10	26%	39	100%				
0:01-3:00	47	81%	47	81%	14	36%	14	36%	23	96%	23	96%
3:01-6:00	9	16%	56	97%	15	39%	29	74%	1	4%	24	100%
6:01-9:00	0	0%	56	97%	6	15%	35	90%				
9:01-12:00	1	2%	57	98%	2	5%	37	95%				
12:01+	1	2%	58	100%	2	5%	39	100%				
25%		36 sec				141 sec				30 sec		
50%		72 sec				243 sec				40 sec		
75%		157 sec				351 sec				71 sec		

**Analysis:** Only three components had enough users to justify this level of analysis. (And, to be honest, panels really doesn't.)

The top section of the chart shows one-minute increments; the middle section chart shows three-minute increments (so we can compare to early charts, if we so desire); and the bottom shows percentiles.

Nothing terribly astonishing here, though it does help illustrate the holding power of the quiz show. After two minutes, most everyone is finished with the panels; about 2/3rds are finished with the newscast; but only 20% have left the quiz show.

## SUMMARY OF FINDINGS

### GENERAL USAGE

Time spent is excellent – mean of 4 to 5 minutes per visitor, for an exhibit that’s only about 500 square feet. Even the median of 3:30 is very good.

Components used is disappointing – average visitor uses two components; half only use one; 86% use three or fewer; only 5% use half of them. Perhaps we don’t need so many components?

No apparent sex-based differences. Adults spend less time than kids, both mean and median, and are more likely to make just one stop and leave. How to draw them in? See possible answer below. (The interviews showed the opposite pattern – adults more likely to make more than one stop. Are adults “over-estimating” in the interviews?)

Newscast and quiz show are most attractive (in terms of initial stop), being the first component used for almost 70%. Panels are a strong third, attracting adults almost exclusively. Furthermore, adults who start with panels are much more likely to go on to other things than adults who start elsewhere. Panels may be acting as that “advance organizer,” making sense out of the disparate activities. Perhaps having larger, more attractive and engaging panels would draw in more adults, and encourage them to explore more of the space.

### COMPONENT USE:

- Newscast is clear winner in terms of popularity, use, and activity, especially among kids. Dwell-time and quality use are strong, but not tops.
- Quiz show second most popular, and tops in quality use.
- Panels do reasonably well among adults
- Radio is pretty popular with boys, but time is very brief, indicating superficial use.
- Website had middling popularity and was pretty strong in full participation.
- Activity table gets some dwell time, but otherwise is not impressive.
- Nutritionist is pretty much middling in all areas.
- Plasma, despite its expense, is doing little for us.
- Post-its are desirable for audience feedback, but are doing almost nothing.
- Culture panels I love, but again they do almost nothing for us.

### RECOMMENDATIONS

1. Think of ways to increase number of components used.
2. Try to increase and take advantage of panels’ power to attract and hold adults.
3. Try to add a little more “meat” to popular the newscast experience.
4. Cut a few components.
5. If we keep activity table, give adults a little something to do, too.