This evaluation project accessed visitor interaction with the Materials Wall, part of a set of prototypes based around Nanotechnology created for MSI. The Material Wall consists of nine stations that each detail a different material. At each station there is a short interactive experiment for the visitor to do, brief (one or two sentence) instructions, an image and a short text that describe uses of the material, a list of real-world applications and a model of the atomic structure of the material. The main message of the Materials Wall is that everything is made from atoms, and that changes in atomic structure produce changes in a material’s properties.

Two interviewers used informal semi-structured interviews to investigate reactions of visitors who had just interacted with the Materials Wall. The interviews focused on usability of the interactives and whether the messages intended by the curators of the exhibits were being effectively communicated.

We found that the visitors found the interactives very easy to use, but had clear preferences. We also found that the visitors general picked up that the exhibits were about atoms, or materials, and that they felt it had some connection to their daily lives, but in general they did not gain a much more in-depth knowledge from the exhibit than this. Overall the exhibits were thought to be interesting and fun, and the hands-on approach was much appreciated.
Effectiveness of the evaluation technique

The aim of the evaluations was to explore visitor reactions to the materials wall, so we decided to use short semi-structured interviews that could address three particular questions but allow plenty of room for individual elaboration based on the interviewee's volunteered responses.

The Materials Wall exhibits were situated in a temporary room dedicated to Nanotechnology prototypes erected off the Networld and Hungry Planet exhibitions at MSI. Visitors were approached in the Networld exhibition and asked if they would like to view new prototypes as part of an evaluation project. After they had looked at the Material Wall they were asked to participate in a short interview.

Two interviewers were used: one to ask questions and the other to write down the responses. This strategy was chosen firstly so that the visitor would not have to write anything themselves—thus allowing the interviewer to immediately follow up on unclear issues and to make the interview itself more attractive. Secondly, two people were used so that the interviewer would be able to maintain a flow of conversation with having to stop and write down responses. This technique was found to be effective in this evaluation project.

The questions were intended to be phrased in such a way that the visitor would feel comfortable, with an emphasis on them testing the exhibits, rather than the interview testing their knowledge. Whether this was successful is hard to evaluate—some visitors appeared more confident being negative than others. Because of the open-ended nature of the semi-structured interview we were able to rephrase and re-ask the question several times if we felt that the visitor was giving a reply they thought we wanted to hear rather than what they actually felt.
Thirty interviews were conducted altogether, with a mix of ages and genders. We purposefully avoided school-aged children, however, because we had been advised by MSI that they would be conducting their own evaluations of this age group.

**Results of the evaluations**

**Ease of use**

Question: A variation on “Did you find the exhibit easy to use?”

The visitors overwhelmingly found the exhibits easy to use. Although we had some concerns that visitors would be reluctant to admit that they personally could not work out what to do, we did not observe people having significant problems when performing the hands-on experiments either. The instructional labels were reported as being easy to follow, even when the visitors could not work out what was going on when they actually did the experiment, as was often the case with the foam. Where there were problems, this seemed to be due to the equipment rather than the instructions—for instance the batteries in the flash light running out, the 'happy' and 'sad' balls being swapped around, the base of the tubes in the [first bouncing ball] exhibit being reversed so that ball bearings did not bounce on the material, the [absorbent diaper material] tubes not having been refilled. One visitor (male, 22) reported that he couldn't work out where to pour the water in the hydrophobic sand exhibit, but this may have been because he was the first person to use it. Once the exhibit had been used a few times it appears it became obvious what to do, as no other visitor reported confusion over it.

**Favourite exhibits**

Question: A variation on “What were your favourite and least favourite exhibits?”
After approximately six interviews we started to ask which was the favourite and least favourite exhibit, although the motivation for this was mainly to encourage conversation within the interview. Visitors seemed to have less trouble with this question and it encouraged them to talk more openly about their opinions. It also, however, revealed a very consistent trend: the foam interactive experiment consistently was described as the least favourite, closely followed by the nickel nano wires and the opal experiment. The most popular were the hydrophobic sand, the memory metal and the ferro fluid. The “happy” and “sad” balls experiment received mixed reactions which were less polarised towards either positive or negative. The was confusion among at least two visitors as to why the balls were referred to as “happy” and “sad” balls. These results came back across genders and ages.

The foam was considered to be unappealing because it was difficult to see the difference in the two types of foam, thus the result of the experiment was not dramatic enough to be interesting. The opal experiment was also considered undramatic, possibly because the overhead lighting in the exhibition room meant that the effect could already be seen without the need for the flashlight, so that when the instructions were followed there was no resulting difference in appearance.

*Message of the exhibition*

Question: A variation on “What is the exhibit about? What message does it convey?”

The visitors generally said that they found the message of the exhibit easy to understand, and that it wasn't confusing. Those who volunteered that they had a science background seemed very positive about the exhibit, and did not think it was aimed at too simplistic a level. While it is unlikely that people would admit that they did not understand what they saw, we tried to encourage people to let us know if we thought the exhibition message was confusing for them or for other visitors, as an evaluation
of the success of the exhibit, not of their knowledge of the subject. Thus, we attempted to shift the focus onto the exhibit rather than onto the visitors. Visitors still appeared reluctant to admit if they did not understand an exhibit, however, so we concentrated only on their response to the question, in order to gauge whether or not they had been able to understand it.

When asked what they thought the exhibition was about, the visitors frequently used the word 'atoms' and, less frequently but still often, the word 'materials'. Responses that touched upon atoms and the structure or material properties of things or on how changes in atomic structures produce changes in material properties were common, suggesting that the main message of the exhibit was being effectively communicated. However, a response that focused on the materials—for instance that it was all about new/future technologies or about the daily applications of new technologies—prevailed in at least five interviews. Only two visitors mentioned nanotechnology; one of these had been told that the exhibit was about nanotechnology, while the other was a scientist. Only one visitor did not come away with any message from the exhibit.

Relevance to daily life

Question: A variation on “Do you think this exhibit has any relevance to your daily life?” Visitors tended not to be able to pinpoint specific ways in which this exhibition was relevant to their daily life. Those who did see it as relevant, pointed to the diaper image, the memory metal image or the crash helmet image, searching the exhibit while thinking of an answer. Some suggested that the application text was too small to read, or had too little explanation to make it meaningful. One visitor did mention that highlighting specific text in the list of applications helped to focus his attention though he wished there was more of it. When referring to the interactive experiments they usually mentioned the diaper material or the foam, but rarely
referred to daily applications of the other materials, except a few references to the “happy” and “sad” bouncing balls.

Despite not being able to pick out many examples, it was common for the visitors to claim that they could see the relevance of this exhibit to their daily lives. This may have been a response to the phrasing of the question, which generally took the form "Do you think this exhibit has any relevance to your daily life, or is it just about science that's out there somewhere?" Some claimed the relevance was related to the new materials that are now available, inferring that the materials were of use in wider society, but not necessarily to the visitor's personal life. At least four of the visitors wanted to see more reference to daily life, and to have the uses and applications of the materials explained further.

**Other observations from the evaluations**

The visitors were asked if they had any further questions or comments. Most expressed enthusiasm for the exhibits, particularly the hands-on aspect and the ability to do small experiments themselves and see a result. This side of the exhibition was very positively received. A few commented that they would like more explanation of why or how the material reacted the way it did, and this comment was made in reference to the exhibit they had found most interesting (e.g. the hydrophobic sand) In general, however, it was felt that the level of explanation was sufficient. There were various concerns about practicalities—that children would steal components or would squirt the water at each other, that the small parts would get lost or stop working. Other specific comments included:

- Would like more living things, all these are too artificial, man-made (female, 26; male, 27)
• Might be easier to see absorbent polymer in a larger container instead of the test tubes
  (male school group chaperone, 28)

None of the visitors referred to the atomic structures on the walls, leading us to infer that they were either not noticed or not understood, given that every other aspect of the exhibitions were discussed specifically (images, text, experiments).

From our observations of visitors interacting with the Material Wall we noticed that they tended to start at one end and work their way along, and that the visitors usually tried every experiment in turn. Groups would call over to each other to show things they found particularly interesting, or would move along the wall as group, suggesting that this exhibition is good for social interaction.