

# **The Impact of One World One Sky on Children's Interest and Learning about Astronomy**

## **Final Report**

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## Executive Summary

*One World One Sky* is a planetarium-based show that uses *Sesame Street* characters to introduce young children four to six years of age to some basic ideas about astronomy. Funded by the U.S. National Science Foundation (DRL 0307886), *One World One Sky (OWOS)* was developed through a collaboration involving Sesame Workshop, the Adler Planetarium in Chicago, The Liberty Science Center in New Jersey, and the Beijing Planetarium in China. It is a 25-minute planetarium show that is normally projected onto a planetarium surface, but can be shown in mobile planetarium units. Brochures were also produced and distributed that highlighted the educational messages, as well as ways that adult caregivers can extend the learning of the show outside the planetarium. In addition, a website was produced that includes all of the print and video resources of the project, as well as a Teacher's Guide containing strategies and suggestions for incorporating the educational goals of the project into the classroom. The U.S. version was produced in English and Spanish and the China version was produced in Mandarin.

The project was designed to (1) provide young Chinese and American children aged 4 to 6 with an age-appropriate introduction to astronomy, (2) promote positive attitudes toward science among young children in both countries, and (3) foster understanding of one another among children in China and the United States.

The story of *One World One Sky* begins on *Sesame Street* when Elmo's friend, Hu Hu Zhu, visits from China. Together, Big Bird, Elmo, and Hu Hu Zhu look at the night sky and all of the wonderful things it contains. Through a combination of direct viewing and the use of their imagination, they visit the Moon and learn some basic astronomy concepts. Children learn to say star in Mandarin and in English and acquire some understanding of the culture of the two countries.

An evaluation of the impact of the OWOS show found that:

- Children in both countries enjoyed the show, acquired some new information about basic astronomy ideas, and increased their understanding of the language and culture of the other country.
- Teachers in both countries assessed the OWOS positively and engaged in a variety of follow-up activities in their classroom in the weeks following the viewing. The viewing experience stimulated many teachers to seek additional information from the Internet and to plan additional informal science learning visits to other planetariums or museums.
- Parents in both countries who accompanied a child to the OWOS show reported that they found OWOS to be enjoyable and of educational value for their child or children. Many of the parents indicated that they had engaged in post-show learning activities with their child, ranging from looking at the night sky and talking about the experience to using the Internet to search for additional information or materials.
- Both teachers and parents said that they would bring their class or child back to the planetarium (or other science learning facility) in the future, indicating a disposition toward more frequent informal science learning.

# **The Impact of *One World One Sky* on Children's Interest and Learning about Astronomy**

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- provide young Chinese and American children aged 4 to 6 with an age-appropriate introduction to astronomy,
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- foster understanding of one another among children in China and the United States.

The story of *One World One Sky* begins on *Sesame Street* when Elmo's friend, Hu Hu Zhu, visits from China. Together, Big Bird, Elmo, and Hu Hu Zhu look at the night sky and all of the wonderful things it contains. They locate the Big Dipper, the North Star and the Moon. Elmo and Hu Hu Zhu want to learn more about the Moon, so Big Bird suggests that they use their imagination to travel there. Once on the Moon, Elmo and Hu Hu Zhu quickly learn that the Moon has a very different environment than Earth. They discover there is no air on the Moon and learn that without air there can be no trees, animals, flowers, or, to their disappointment, flying kites or playing soccer. Realizing this makes them homesick, so they use their imagination to take them back to *Sesame Street*. Back on Earth, Big Bird, Elmo, and Hu Hu Zhu realize that even though they live in two different countries, they still share the same sky.

## **The Evaluation Design and Plan**

To assess the impact of viewing the OWOS show on its young audience, a two-part design was used in the U.S. and China. The two-part design reflects the two major ways that young children see OWOS – as a part of a school group or with one or both of their parents. For both groups, the evaluation was designed to look at short-term attitudinal and information gains by the child and at longer term exposure to follow-up activities in the classroom or home.

For children visiting a planetarium as a part of a school group, prior permission to assess the children was obtained from the teacher and each child and each teacher was asked a short set of questions prior to viewing OWOS. Immediately after viewing the show, each child was asked a short set of follow-up questions by an interviewer (usually a college-aged worker from the planetarium). Each teacher was also asked a short set of evaluation questions and was asked for contact information for a follow-up telephone interview approximately six weeks after the viewing. The follow-up telephone interview asked about classroom activities conducted by the teacher that attempted to build on the viewing experience and about any changes in curriculum or teaching plans that were made by the teacher because of the OWOS experience, including a Teacher's Guide that was available online in China (in Mandarin) and the United States (in English and Spanish).

For children visiting a planetarium with a parent, permission to interview the child and parent was obtained from the parent shortly after they arrived at the planetarium or after they had purchased a ticket to see OWOS. Prior to viewing OWOS, each child and each parent was interviewed separately by interviewers about their interest in looking at the sky and their use of informal science learning resources. Immediately after viewing OWOS, each child and each parent was interviewed a second time and asked about their immediate assessment of the show and each child was asked about a short set of information items that they might have learned about by watching OWOS. Each parent was asked to participate in a follow-up telephone interview approximately six weeks after the viewing and contact information was collected. In the follow-up telephone interview, each parent was asked about activities that he or she had done with their child related to the OWOS experience – buying additional books or materials, visiting other planetariums or museums, looking at the night sky, or talking about some of the ideas introduced in OWOS.

**Sample Selection for Evaluation.** The sample of institutions in both China and the United States was a rolling sample reflecting the institutions that were presenting the show during the evaluation period. Sites were selected to reflect a mixture of free-standing planetariums and portable planetarium sites. Sites were selected to reflect a cross-section of large cities and middle-sized urban areas and some rural areas that used portable sites. Because of the voluntary process through which local planetariums and schools decided to show *One World One Sky*, it was not possible to construct a probability sample of all sites at which the show was presented.

A total of 156 young children in the U.S. and 556 young children in China completed both the pre-show and post-show interview (see Table 1). The disparity in sample size reflects differences in the nature of the venues and the sampling procedures. In both China and the U.S., the interviewer would randomly select a parent from the line of parents waiting to buy a ticket or just entering the theatre area and ask for permission to interview the parent and the child.

The sample selection procedures for class visits differed in the U.S. and China. In the U.S., school groups generally arrive at a planetarium on a school bus with 30 to 50 students and two or three teachers and one or two parent helpers. They often have a pre-arranged reservation and have a relatively tight schedule to get into the theatre area, line up and go into the theatre, and then exit and re-assemble in the lobby/waiting area outside the theatre. In many cases, they are scheduled to use a lunch room and have a limited amount of time for lunch, visiting other parts

of the planetarium, and then getting on their bus to return to their school. In this context, the U.S. interviewers had to secure the written agreement of teacher to interview the children and then to select a sample of children, conduct a pre-show interview with each selected child, and then locate the same children after the show and conduct a post-show interview with each child. In the context of the tight schedules for most class visits, it was possible to interview only four to eight students out of each class group. The U.S. teams worked with groups of three or four interviewers.

In contrast, Chinese schools do not have school buses and special arrangements had to be made to rent a bus or obtain transportation from a local government agency. The class visits to the planetarium were a special event. The Chinese field teams included several college students from the Graduate University of the China Academy of Sciences and they arranged to interview all of the students in each visiting class before the show and after the show. In most cases, only one class was scheduled for an entire morning or afternoon, unlike the hectic and crowded environment in U.S. planetariums. Thus, a total of 473 Chinese student interviews were collected compared to only 62 U.S. class visit interviews (see Table 1).

In China, the sample consisted almost entirely of kindergarten and first-grade students. In the U.S. the audience included more pre-kindergarten students and more second grade students.

**Table 1: Grade Level and Type of Student Included in the Evaluation**

Level	With Class	With Parent	Total
<b>U.S. Children</b>			
Pre-school	33	35	68
Kindergarten	8	25	33
1 <sup>st</sup> grade	17	18	35
2 <sup>nd</sup> grade	4	16	20
Total	62	94	156
<b>Chinese Children</b>			
Pre-school	0	0	0
Kindergarten	162	82	244
1 <sup>st</sup> grade	308	1	309
2 <sup>nd</sup> grade	3	0	3
Total	473	83	556

In the U.S., data were collected at both traditional planetariums and at school sites using a portable dome and projector. A similar mix of traditional planetarium sites and dome showings at schools was used in China. In the U.S., slightly more students were interviewed in traditional planetarium settings accompanied by a parent than on school field trips, but in China, substantially more students were interviewed in class groups than in the company of their parents (see Table 1). These variations in site of viewing reflect both the general patterns of the distribution of the OWOS show in the two countries and issues of access and physical proximity for field work. A listing of sites in China and the United States used in this evaluation is included in Appendix A to this report.

### **The Impact of OWOS on Young Children**

The American children included in this study were generally familiar with Big Bird and *Sesame Street*. Approximately 90% of American children recognized a picture of Big Bird and could say his name prior to viewing OWOS. In contrast, only 17% of Chinese students recognized a picture of Big Bird. In China, *Sesame Street* was broadcast a number of years ago in the Shanghai market but has not been broadcast in other parts of China. A number of *Sesame Street* character toys are sold in China and, given the ages of the Chinese students who viewed OWOS, it is likely that they were exposed to Big Bird through toys than through any prior experience with the show.

**Background experiences.** Almost all of the children in both countries reported that they had previously looked at the night sky and seen the Moon and the stars. More than 80% of the children from both countries viewing OWOS had previously visited a zoo. About 83% of American children reported having visited an aquarium, compared to 63% of Chinese children. Given the general similarity on exposure to informal science learning opportunities, this differential may reflect the greater availability of aquariums in the U.S. at the present time.

**Home computer access.** A substantial majority of children in both countries reported having a computer at home. Fully 97% of U.S. children who viewed OWOS indicated that they had a computer at home and 91% claimed that they were allowed to use the home computer sometimes. In China, 85% of children who viewed OWOS reported that they had a computer at home and 59% of Chinese children said that they were allowed to use the home computer sometimes. Home access to a computer is a useful indicator of the ability of students and parents to obtain follow-up information relevant to the OWOS viewing experience from the Internet and other online resources. Access to home computing does not assure that a child or parent will seek additional information, but it lowers some of the barriers to seeking and acquiring additional information. It is useful to note that both the U.S. and the Chinese samples tend to over-represent urban populations because of the preponderance of planetariums in major urban areas. It is necessary to note that parents who visit to a planetarium with their child tend to reflect families with more education and resources, and this pattern was relatively common in both countries. The frequency of home computers reported in this study is higher than other data would suggest for either China or the U.S. (Kennedy, Smith, Wells, & Wellman, 2008).

**Child assessment of OWOS.** The children in both countries enjoyed watching OWOS. When asked after viewing the show to evaluate it by selecting one of five faces – ranging from a large frowning face to a large smiling face, with intervening smaller frowning, neutral, and smiling faces – approximately 90% of the children in both countries selected one of the smiling faces (see Table 2). The level of enjoyment was relatively uniform across grades in both countries.

Three out of four American children thought that the length of the show was “about right,” compared to half of Chinese students. Fifteen percent of American students who viewed OWOS thought that it was too long, with pre-kindergarten and kindergarten children being slightly more likely to think that it was too long. Among Chinese students, approximately one in four thought that it was too long and one in four thought that it was too short.

**Table 2: Child assessment of OWOS.**

Level	Student assessment of OWOS						N
	A	B	C	D	F	GPA	
<b>U.S. Children</b>							
Pre-school	85%	7%	5%	0%	3%	3.7	60
Kindergarten	74	19	7	0	0	3.7	31
1 <sup>st</sup> grade	68	13	19	0	0	3.5	31
2 <sup>nd</sup> grade	50	39	11	0	0	3.4	18
All levels	74	15	9	0	1	3.6	140
<b>Chinese Children</b>							
Kindergarten	85	7	6	1	1	3.8	193
1 <sup>st</sup> grade	86	9	4	1	0	3.8	290
2 <sup>nd</sup> grade	100	0	0	0	0	4.0	3
All levels	86	8	5	1	0	3.8	486
<p>Question: If this smiling face means that you liked the show a lot (pointing to largest smiling face) and this frowning face means that you did not like the show at all, which face would be the best one to say how much you liked the show? You can pick any face on this card.</p> <p>A = large smiling face            B = smaller smiling face            C = neutral face            D = smaller frowning face            E = large frowning face</p>							

**Child science learning from OWOS.** The evaluation also found a gain in information about some basic astronomy ideas in both countries. In the pre-show interview, each child was asked three knowledge-based questions about the Sun and the Moon. The same three questions were repeated in the post-show interview. A comparison of the results indicates that most of the children in both countries acquired new information as a result of watching OWOS. Sixty-seven percent of American children improved their score after watching OWOS and an additional 19% had the top score in the pre-show and post-show questions (see Table 3). Forty-four percent of Chinese children improved their score after watching OWOS and 17% had the top score prior to watching the show. These results suggest that the children in both countries were attentive to the show and that they found the substantive material to be sufficiently interesting to retain it for a period immediately after the show.

**Child learning about language and culture from OWOS.** Prior to seeing OWOS, only one percent of American children could say star in Mandarin, but 17% were able to pronounce it correctly after the show. Twenty-seven percent of Chinese children were able to say star in English prior to viewing OWOS and 40% were able to do so after the show. These results reflect, in part, the fact that Chinese children (especially in urban areas) study English from first grade through 12<sup>th</sup> grade and American elementary school children rarely study any foreign language. One of the original objectives of this project was to foster cross-cultural understanding, and these results indicate that OWOS made a useful contribution in that regard.

**Table 3: Change in Child Knowledge Score After Viewing OWOS.**

Pre-show Knowledge Score	Post-viewing Knowledge Score				N
	0	1	2	3	
<b>U. S. Children</b>					
0	0%	50%	0%	50%	6
1	0	17	29	54	42
2	0	3	17	80	79
3	0	0	7	93	29
All children	0	8	17	75	156
<b>Chinese Children</b>					
0	17	23	47	13	30
1	12	22	49	17	224
2	13	9	44	34	210
3	7	9	33	51	93
All children	12	15	44	29	557
The three questions used in this scale were:					
Is the Sun a star, a moon, or just a very bright planet?					
Do you think that there are a lot of trees on the Moon, just a few trees on the Moon, or no trees on the Moon?					
Do people in China and people here in [city] see the SAME stars at night or DIFFERENT stars?					



To assess general learning about the other country, American children were asked prior to seeing OWOS what they could tell the interviewer about China and were asked the same question after viewing the show. Chinese children were asked what they knew about the United States prior to and after seeing the OWOS show. This loose open-ended format is appropriate for young children who are just beginning to acquire facts and images of other countries and peoples; it would be inappropriate to expect well developed cultural understanding from four to six year olds.

The results show a moderate gain in both countries, with the largest gains being registered by first-grade students. In the U.S., half of children in the study were able to mention at least one correct observation about China prior to seeing the show and 64% were able to do so after watching OWOS. After viewing OWOS, American children were more likely to mention geographic features of China – there was frequent mention of lakes and mountains in China and beautiful forests and other landscape features. In the post-show interview, U.S. students were more likely to mention that China has a different language, undoubtedly reflecting the effort of the show to encourage children to learn to say star in Mandarin. There was also an increased awareness of the distance to China and that it was on the other side of the Earth, but several children were careful to point out that “you see the same stars” in China – another of the points emphasized by OWOS.

Chinese children displayed a similar change in cultural awareness. Prior to seeing OWOS, 40% of Chinese students were able to provide at least one correct observation about the U.S. and 53% were able to do so after watching the OWOS show. In a pattern similar to U.S. students, the comments of Chinese students after viewing OWOS emphasized the open spaces in the U.S., beautiful mountains and lakes, and several children specifically mentioned the Grand Canyon. Several Chinese students also mentioned the number of tall buildings in the U.S. and a few mentioned football.

### **Follow-up Activities in Classrooms**

This evaluation was designed to assess both the short-term impression of teachers and the longer term utilization of material from OWOS in classroom activities and instruction. To measure the short-term impact of OWOS, the teacher of each of the classes that participated in the evaluation was asked some background questions prior to the show and a few evaluation questions immediately after the show. These results provide a useful context for understanding the utilization and impact of OWOS. To measure the longer-term impact of OWOS in both China and the U.S., each teacher was interviewed by telephone approximately six weeks after the viewing and asked about various kinds of follow-up activities related to the viewing of OWOS.

To assess the impact of these follow-up activities, each teacher’s responses are weighted by the number of students in his or her class who attended the OWOS showing. Although we were able to select and interview only a smaller number of students from each class for logistical reasons, it is important to recognize that the follow-up activities involve and serve all of the students in each class that visited a planetarium or viewed the show on a portable dome at their school.

**Teacher background and class characteristics.** The mean class size for the groups visiting a planetarium to view OWOS was 20 in the U.S. and 40 in China (see Table 4). Many of the teachers in both countries had a decade or more of teaching experience, including several years at their current grade level. American teachers were more likely to have visited a planetarium during the preceding year than Chinese teachers, but the reported frequency of visits to science museums and centers was mixed. American teachers reported a higher number of astronomy-related classroom discussions prior to the visit than Chinese teachers.

**Table 4: Teacher Experience and Preparation for Visit.**

	Level				All Levels
	Pre-K	K	Grade 1	Grade 2	
<b>U.S. Teachers</b>					
Class size (mean)	18	22	21	19	20
Years in teaching (mean)	11	12	5	11	10
Yrs teaching at current level (mean)	9	9	4	8	8
Visited a planetarium earlier in year	31%	25%	42%	39%	33%
Visited a science museum this year	16%	52%	0%	78%	27%
Num of related class discussions	4	6	3	1	4
Percentage of students able to read	2	37	97	100	43
Weighted N	197	87	103	54	441
<b>Chinese Teachers</b>					
Class size (mean)	--	40	40	--	40
Years in teaching (mean)	--	10	15	--	12
Yrs teaching at current level (mean)	--	4	2	--	3
Visited a planetarium earlier in year	--	5%	14%	--	8%
Visited a science museum this year	--	0%	27%	--	10%
Num of related class discussions	--	1	2	--	2
Percentage of students able to read	--	46	58	--	50
Weighted N	0	541	346	0	887
The number of teachers in both countries is weighted by the number of students in their class. The weighted number reflects the number of students served by these teachers.					

**Child reading level.** It is important to recognize that this is a period during which most children acquire reading skills. Child reading skill is an important indicator of the kinds of follow-up learning and information acquisition that is possible for the child. Children who can read may be able to acquire more information from a book on stars purchased by a parent than a child who cannot read and must have someone read it to them. Only two percent of U.S. pre-kindergarten children were able to read, but the teachers reported that about 37% of the kindergarten level students could read. Almost all of the first and second grade American students were classified as able to read. Kindergarten teachers in China reported that 46% of their students could read and first grade teachers in China indicated that 58% of their students could read. These patterns may reflect the complexity of learning Chinese characters and a gradual approach to language learning in China.

**Teacher assessment of OWOS.** Teachers at all levels in both countries liked the OWOS show and gave it a positive evaluation. Using a zero-to-10 scale with zero meaning that the teacher disagreed completely with a statement and 10 signifying that the teacher agreed completely with the statement, American teachers of classes that viewed OWOS gave it a mean rating of 9.0 in terms of overall quality and educational value and Chinese teachers gave it a rating of 9.8 on the same scale (see Table 5). This level of approval was uniformly high across grade levels.

American and Chinese teachers thought that the OWOS show had substantial educational value and excited their students to learn more about the sky, with mean ratings of 9.1 or higher. Teachers in the U.S. and China agreed that they would use material from the show to talk to their students about the basic astronomy items included in OWOS and that they would recommend the show to other teachers.

There was broad agreement in both countries that the viewing facility was clean and that the seating was comfortable, except for second grade teachers in the U.S. who found the seating to be unsatisfactory.

Overwhelmingly, teachers indicated that they would bring their students back to see OWOS and other shows at the planetarium they were visiting, with mean scores of 9.3 (U.S.) and 9.9 (China) on the 10-point scale. This is a very strong recommendation and endorsement of the OWOS viewing experience.

**Classroom follow-up activities.** The full impact of any show of this kind is the amount of follow-up that it stimulates in classrooms (or families for children attending with a parent). The evaluation design for OWOS included a follow-up telephone call to each teacher approximately six weeks after the viewing experience to inquire about the kinds of follow-up activities that he or she had done with their students. Most of the teachers in both countries were cooperative and were able to provide details about the activities they had conducted.

**Table 5: Teacher Assessment of the OWOS Show.**

Mean score on 0-10 scale	U.S. Teachers					Chinese Teachers		
	All Teachers	Level				All Teachers	Level	
		Pre-K	K	Grade 1	Grade 2		K	Grade 1
The overall quality of this show was very high.	9.0	9.3	10.0	7.6	9.6	9.8	9.8	9.8
The show had a lot of educational value.	9.1	9.1	9.8	8.2	9.6	10.0	10.0	10.0
This show got my students excited about learning about the sky.	9.5	9.5	10.0	9.0	9.6	9.9	10.0	9.8
This show had too much entertainment and not enough science.	4.9	4.0	5.1	5.3	8.9	3.6	3.3	4.0
I will use some of the material from this show to talk to my students about the sky.	8.9	8.6	8.6	9.6	9.6	9.3	9.9	8.6
I will look for other educational materials to help my students understand more about this subject.	9.2	8.8	9.3	9.6	9.6	9.4	9.8	8.8
I will recommend this show to other teachers.	9.2	9.2	9.8	8.6	10.0	9.9	9.8	10.0
The facility was clean and comfortable.	10.0	10.0	10.0	10.0	9.6	9.6	10.0	9.0
The seating was comfortable.	9.3	9.6	10.0	10.0	3.9	9.6	10.0	8.9
I will bring my students back here again for other shows.	9.3	9.1	10.0	8.6	10.0	9.9	10.0	9.8
Weighted N	420	197	87	103	33	832	486	346
The number of teachers in both countries is weighted by the number of students in their class. The weighted number reflects the number of students served by these teachers.								

Almost all of the U.S. teachers in pre-kindergarten, kindergarten, and first grade reported that they held classroom discussions of the subject material in OWOS, but none of the second-grade teachers reported engaging in this kind of discussion (see Table 6). About half of the teachers asked their students to look at the night sky as a part of their follow-up activities and about half of those who asked reported that they held follow-up discussions in class about the observing experiences of their students. In general, given the pressures on classroom time, this is a satisfactory result.

Chinese teachers reported a similar pattern of follow-up activities, with a higher level of follow-up than U.S. teachers in some areas. Over 90% of Chinese teachers had talked to their students in class about the OWOS show. Fifty-nine percent of Chinese teachers indicated that they asked their students to look at the night sky and nearly the same proportion followed-up on this request with in-class discussions about the night sky viewing experience. More than 80% of Chinese teachers said that they had visited other informal learning centers and museums subsequent to their viewing of OWOS, which is substantially higher than the level of follow-up activity reported by American teachers. Finally, half of Chinese kindergarten teachers reported that they had looked for additional information on the Web, but no American teacher made the same claim.

**Table 6: Teacher Follow-up Activities after Viewing OWOS.**

	All Teachers	Level			
		Pre-K	K	Grade 1	Grade 2
<b>U.S. Teachers</b>					
Talked with students about OWOS	90%	91%	100%	100%	0%
Asked students to look at night sky	41	28	100	50	0
Talked in class about night sky viewing	20	8	50	50	0
Visited other informal learning sites	7	11	0	0	0
Looked for information on the Web	0	0	0	0	0
Downloaded the Teachers Guide	0	0	0	0	0
Weighted N	278	182	44	40	12
<b>Chinese Teachers</b>					
Talked with students about OWOS	92%	--	90%	100%	--
Asked students to look at night sky	59	--	66	0	--
Talked in class about night sky viewing	57	--	57	0	--
Visited other informal learning sites	83	--	81	100	--
Looked for information on the Web	51	--	57	0	--
Downloaded the Teachers Guide	0	--	0	0	--
Weighted N	402	0	338	64	0
The number of teachers is weighted by the number of students in their class. The weighted number reflects the number of students served by these teachers.					

**Use of the Teacher’s Guide.** The results indicate that none of the Chinese or U.S. teachers in the evaluation downloaded the Teacher’s Guide for OWOS or used it. Future projects of this kind should include a clear line of responsibility for the preparation and distribution of these supplementary materials and a budget to support it throughout the run of the show in each location. It might be possible to link school reservations for a visit to a planetarium with a discussion and decision about either sending printed materials or encouraging the use of online resources.

**Summary.** Overall, these results indicate that all of the teachers in both countries who brought their classes to see OWOS had high regard for the educational content and show experience, and expected to use it in their classes for instructional purposes. The follow-up data document this experience, indicating that the show was widely discussed in classrooms who viewed it. Teachers reported that the OWOS show increased the interest of their students in studying the sky and many of the teachers asked their students to look at the night sky from their homes and discussed the results in class.

### **Follow-up Activities in Families**

Approximately 60% of American children visited a planetarium with a parent prior to viewing OWOS, compared to 15% of Chinese students (see Table 1). Although the limited samples used in this evaluation are insufficient to make broad judgments about the use of informal learning resources by parents in the U.S. and China, the field staff in China reported that many Chinese parents were reluctant to bring very young children to a planetarium or science museums, preferring to wait until a child is somewhat older. It may be useful to explore this cultural difference in future studies, but it is important to examine the level of parent engagement in this viewing experience for those parents who do utilize this kind of resource for their children.

The impact of the OWOS viewing experience depended on (1) each child’s interest in the subject matter, (2) each child’s understanding of the basic ideas presented, (3) the interest of the child’s parents in the subject matter of the show, and (4) the involvement of the parent in the child’s education. The literature indicates that better educated parents make more use of informal science learning facilities such as planetariums and that they often do so as a means to stimulate interest in their child in selected subjects (Ellenbogen, Luke, & Dierking, 2007; Borun, Chambers, & Cleghorn, 1996). Ideally, we would like to have known more about the educational background of each of the parents of children viewing OWOS, but a direct inquiry about the level of education may be seen as intrusive to some parents and as a way to pre-judge their child. We decided not to ask about parent education directly.

**Parent interest patterns.** A closely related factor is the level of parent interest in science, astronomy, and mathematics as subject areas. In the pre-show questionnaire, each parent was asked to rate his or her interest in a set of subject areas using a zero-to-10 scale, with the high value reflecting greater interest in the subject. The results show that the parents of American children viewing OWOS were strongly interested in science (7.8) and astronomy (7.1). Chinese parents were also interested in these areas, but reported slightly lower levels of interest on the same metric – 6.4 for science and 6.1 for astronomy. Chinese and American parents were equally interested in mathematics (6.8 and 6.7, respectively) (see Table 7).

Parents in both China and the U.S. expressed roughly similar levels of interest in sports, health and exercise, food and cooking, and learning more about other countries and cultures. The overall result suggest that the parents of the children viewing OWOS were about as interested in science and astronomy as they are in a number of other subject areas relevant to adults, indicating that they were neither strong science advocates nor hostile to science.

**Family informal science learning.** Another way to assess parent interest and background in these areas is to ask about the frequency of other kinds of informal science learning activities. We would expect that parents who take their children to science museums, zoos, aquariums, and similar facilities frequently have a relatively higher level of interest in science and in having their child or children develop an interest in this area. It also reflects the engagement of the parent in child learning outside of school. The pre-show questionnaire asked each parent to report the number of times that they had engaged in various activities during the preceding year.

Parents in both countries reported a moderately high level of prior use of informal science learning resources, but the level of prior use by American parents was somewhat higher than Chinese parents (see Table 8). American parents were more likely to have visited a public library, zoo, aquarium, planetarium, or science center than Chinese parents, but this may reflect

**Table 7: Parent Interest in Selected Subjects.**

Level of Interest on 0-10 scale	All Parents	Child Level			
		Pre-K	K	Grade 1	Grade 2
<b>U.S. Parents</b>					
Science	7.8	8.1	7.8	7.3	8.1
Astronomy	7.1	7.6	7.0	7.6	5.1
Mathematics	6.7	6.6	6.4	7.1	6.5
Sports	6.8	7.4	5.4	7.8	6.6
Health and exercise	7.8	7.9	8.0	7.4	7.4
Food and cooking	7.9	7.9	8.0	8.4	6.7
Learning about other countries	7.8	7.6	8.2	8.1	6.9
Weighted N	89	33	28	18	10
<b>Chinese Parents</b>					
Science	6.4	--	5.1	6.6	--
Astronomy	6.1	--	5.0	6.2	--
Mathematics	6.8	--	6.0	6.9	--
Sports	7.9	--	7.4	8.0	--
Health and exercise	8.8	--	8.9	8.7	--
Food and cooking	7.3	--	8.3	7.2	--
Learning about other countries	6.8	--	7.3	6.7	--
Weighted N	58	0	8	50	0

availability and accessibility as well as parental experience and traditions. Chinese and American parents reported similar levels of looking at the night sky without a telescope and watching science television shows. American parents were slightly more likely to have looked for science information on the Internet than Chinese parents.

**Home computer access.** There was broad access to a home computer in both Chinese and American households who viewed OWOS. Ninety-seven percent of American parents reported that they have a home computer and 91% indicated that their child was allowed to use the computer. Eighty-five percent of Chinese parents reported a computer at home and 59% reported that their child was allowed to use it. As noted earlier, both samples tend to over-represent urban populations and these rates may not apply to all parents in either country.

**Table 8: Parent Engagement in Selected Informal Science Learning Activities.**

Median number of times in last year	All Parents	Child Level			
		Pre-K	K	Grade 1	Grade 2
<b>U.S. Parents</b>					
Visited a public library	8	10	10	6	6
Visited a zoo or aquarium	4	4	4	3	3
Visited a planetarium	1	1	1	1	1
Visited a science museum or center	2	2	4	3	2
Looked at the night sky with a telescope	0	0	0	0	0
Looked at the night sky without a teles...	7	8	10	5	4
Watched a TV show about science	5	10	5	3	7
Looked for science info on the Internet	3	3	5	2	4
Weighted N	91	33	29	19	10
<b>Chinese Parents</b>					
Visited a public library	3	--	3	3	--
Visited a zoo or aquarium	2	--	1	2	--
Visited a planetarium	1	--	1	1	--
Visited a science museum or center	0	--	1	0	--
Looked at the night sky with a telescope	0	--	0	0	--
Looked at the night sky without a teles...	5	--	4	5	--
Watched a TV show about science	4	--	2	4	--
Looked for science info on the Internet	0	--	0	1	--
Weighted N	57	0	8	49	0



**Parent preparation for viewing OWOS.** Viewed in the aggregate, these data indicate that many parents in both countries had previously talked to their child about looking at the night sky and may have used some of the basic astronomy terms included in the OWOS show prior to viewing. When asked if they had prepared their child for the visit to view the OWOS show, one in three U.S. parents and half of Chinese parents said that they had made overt efforts to prepare for the visit. When asked to describe the preparation, discussion or talking about the subject matter was the most common form of preparation, but some parents had found relevant television shows and watched those with their children prior to the visit.

**Parent assessment of OWOS.** Immediately after viewing the OWOS show with their child, each parent was asked to agree or disagree with a short set of statements, using the same zero-to-10 scale used with teachers (see Table 9). Parents in both countries gave the show high marks for overall quality (9.0 in the U.S. and 9.6 in China) and educational value (8.7 in the U.S. and 9.8 in China). Parents in both countries indicated that their children were excited about learning more about the sky because of the show and that the show would provide an opportunity to talk with their child about these subject matters. Parents in both countries tended to disagree that the show included too much entertainment and not enough science. The parents found the facility to be clean and comfortable and the seating to be comfortable. Parents in both countries strongly agreed that they would bring their child back to the planetarium to see new shows in the future.

**Parent brochure.** The staff of Sesame Workshop and several cooperating planetariums produced a brochure that was printed and designed to be distributed to parents or other accompanying adults at the time that they brought a ticket or entered the OWOS show. These materials were available in English and Spanish in the U.S. and in Mandarin in China. The evaluator staff observed that none of the parents included in the study in either country had received or read the OWOS brochure that was designed to familiarize parents or accompanying adults with OWOS and its potential for child learning. Some planetariums in the U.S. reported that they had distributed the brochure in the first weeks that the OWOS show was shown, but that they had exhausted their supply of brochures. None of the planetariums in China appears to have had brochures for distribution. There appears to be a need to facilitate different distribution mechanisms to ensure availability of materials throughout the run of the show.

**Parent follow-up activities.** The OWOS show stimulated parents to get more information on the subjects covered. In an interview immediately after viewing OWOS, most parents indicated that they would look for additional educational materials on the OWOS subject matter (8.7 in the U.S. and 8.8 in China).

About six weeks after the OWOS viewing experience, each parent was interviewed by telephone to ask about activities that he or she may have done with their child as a result of viewing the show. Two-thirds of U.S. parents reported that they had talked with their child about the ideas and concepts involved in the OWOS show in the weeks after the show (see Table 10). About the same proportion indicated that they and their child had looked at stars in the night sky and presumably talked about some of the ideas presented in OWOS. A smaller proportion (27%) had visited another informal science learning facility and 32% purchased some additional learning

**Table 9: Parent Assessment of the OWOS Show.**

Mean score on 0-10 scale	U.S. Parents					Chinese Parents		
	All Parents	Child level				All Parents	Child level	
		Pre-K	K	Grade 1	Grade 2		K	Grade 1
The overall quality of this show was very high.	9.0	8.9	9.2	8.4	9.3	9.6	10.0	9.5
The show had a lot of educational value.	8.7	8.9	8.7	8.2	8.9	9.8	9.7	9.8
This show got my child excited about learning about the sky.	8.0	8.1	8.5	7.6	6.9	9.6	9.3	9.7
This show had too much entertainment and not enough science.	4.8	4.2	5.2	4.6	5.6	3.8	5.4	3.4
I will use some of the material from this show to talk to my child about the sky.	8.5	9.1	8.5	7.2	8.6	9.1	9.0	9.1
I will look for other educational materials to help my child understand more about this subject.	8.7	8.7	8.9	8.3	8.7	8.8	7.9	9.0
I will recommend this show to other parents.	9.0	9.0	9.3	8.2	9.1	9.2	9.3	9.2
The facility was clean and comfortable.	9.8	9.8	10.0	9.3	10.0	9.4	9.3	9.4
The seating was comfortable.	9.6	9.7	9.7	9.3	9.5	9.5	8.9	9.6
I will bring my child back here again for other shows.	9.3	9.5	9.9	8.3	9.0	9.5	9.6	9.4
Weighted N	91	32	29	19	11	44	7	37

materials in response to the show. About one in four U.S. parents said that they had looked for additional information on the Internet to be able to help their child with these ideas. Despite the listing of the Sesame Workshop/OWOS web site during the show, no parent explicitly mentioned visiting this web site.

Looking at the full range of activities reported by American parents, it appears that the OWOS show stimulated parent-child conversations about the night sky and some basic astronomy concepts. Some parents used the event to expand the discussion and bought additional educational materials, visited other informal science learning facilities, or looked for supplemental information on the Internet. These results indicate that OWOS was a useful learning experience for these children and parents.

Chinese parents reported a similar pattern of follow-up activities. More than 60% of Chinese parents talked to their child about the OWOS and 69% indicated that they looked at the night sky with their child after viewing the show (see Table 10). Nearly 30% of Chinese parents took their child to another informal science learning place subsequent to viewing OWOS and one in three Chinese parents bought some additional learning materials for use with their child. One in five Chinese parents looked for additional information on the Internet to supplement the OWOS viewing experience.

**Table 10: Parent Follow-up Activities after Viewing OWOS.**

	All Parents	Child Level			
		Pre-K	K	Grade 1	Grade 2
<b>U.S. Parents</b>					
Talked with child about OWOS	65%	60%	84%	43%	71%
Looked at stars in night sky with child	69	88	68	57	29
Visited other informal learning sites	27	42	22	20	20
Bought relevant learning materials	32	28	41	21	43
Looked for information on the Internet	24	29	23	8	43
Weighted N	65	25	19	14	7
<b>Chinese Parents</b>					
Talked with child about OWOS	64%	58%	86%	46%	67%
Looked at stars in night sky with child	69	90	63	64	33
Visited other informal learning sites	29	41	25	18	20
Bought relevant learning materials	33	32	38	18	50
Looked for information on the Internet	20	28	19	0	33
Weighted N	52	19	16	11	6

## Findings and Conclusions

This evaluation attempted to measure the impact of the *One World One Sky* show on a population of young viewers four to six years of age in China and the United States. This report summarizes the data from several U.S. sites and several Chinese sites (see Appendix A). In broad strokes, the results indicate that the OWOS show attained its primary objectives of providing some basic astronomy information and ideas and stimulating interest in science and in other countries and cultures. Several points merit additional discussion.

First, the results found that the OWOS show had a significant positive impact on the children for which it was intended. It appears to have worked best with kindergarten and first-grade children. The evaluation found a gain in retained knowledge by children in both countries and a substantial amount of parent and teacher follow-up which extended the impact of the viewing experience. The absence of prior television exposure in China did not diminish the generally positive impact of the OWOS experience, but Chinese children were markedly less aware of the characters in OWOS than American children.

Second, the evaluation was designed to recognize that there are two primary ways in which young children are exposed to OWOS and similar shows – as a part of a class group and in the company of parents or guardians. Although the origins of these experiences are different and some of the follow-up activities occur in different venues, there is a striking parallel in the initial learning and follow-up activities associated with these two alternative pathways to viewing OWOS. The obvious question is whether students learn more when exposed to the show with a class or with a parent found an interesting difference between China and the United States. In China, 47% of students who viewed OWOS with a school class displayed an increase in their knowledge score, and an additional 18% had a perfect score on both the pre-test and the post-test. Comparatively, 29% of Chinese students who viewed OWOS with a parent displayed an increase in knowledge, plus seven percent who had a perfect score on both the pre-test and the post-test. This result suggests that the school class setting is a more effective learning venue in China, however, it is important to recognize that the age of children who viewed OWOS with a parent was significantly lower than the age of children who viewed the show with a class.

In contrast, 72% of American children who viewed OWOS with a parent displayed an increase in related knowledge, plus 17% who had a perfect score on both the pre-test and the post-test. Sixty percent of American students who viewed OWOS with a school group showed an improvement in their knowledge score, with 18% who had a perfect score on the pre-test and the post-test. This pattern suggests that a parent-child combination is a more effective learning venue than a school group – the opposite pattern from what was found in China. Given the relatively small sample sizes in both countries, these data are not definitive on this point, but it suggests a line of research that ought to be pursued.

Third, the results suggest that the OWOS show produced some cross-national cultural awareness among children in both China and the U.S. Prior to viewing the show, approximately half of students in both countries were unable to mention any correct observation about the other country, but the proportion increased significantly in both countries after viewing the show. The ability to use the word star in another language is a small item by itself, but it may stimulate a

continuing interest in learning more about stars, about other languages, or other countries. It is a first step toward continued interest and exploration.

Fourth, it appears that the supplemental materials prepared for this show – a downloadable Teacher’s Guide and a parent brochure distributed at the time of the visit – were rarely used. This is not a judgment about the quality of the materials, but rather an observation about the reported utilization rates. Future projects of this kind should consider other media and other means to distribute important materials such as a Teacher’s Guide or a parent brochure. One approach that is currently used in professional meetings and similar settings is the distribution of these materials on a small thumb drive which could be distributed at the time that a parent or teacher visits the planetarium to see the show. These items are relatively inexpensive and are small enough to be carried in a pocket or a purse. Other technologies may emerge that are even more effective, but it is clear that the traditional model of asking teachers or parents to download a file and print it does not work. We would also observe that many of the planetariums in the U.S. and in China appeared to run out of materials (flyers, brochures, and similar items) within a few weeks of beginning the show and that there was no systemic method (or budget) for replenishing these supplies. Future projects of this kind should include some budgetary support and some centralized distribution system to assure the availability of necessary supplies (including thumb drives if that approach is used) throughout the run of the show.

Fifth, although not reflected in the evaluation directly, we observe that the marketing plans and efforts varied substantially among the planetariums and related institutions in which OWOS was shown. In the U.S., some planetariums featured the OWOS show and spent funds to create media coverage and visibility; other institutions noted the availability of the show on their web site and appear to have done little additional marketing. In China, informal science institutions have limited budgets for advertising and rarely do more than posters to promote a show. There appeared to be a good word-of-mouth network among Chinese parents and a successful show tends to generate a growing market over a period of time. Chinese informal education institutions are typically government funded and are less sensitive to ticket sales and revenue. Looking to the future and thinking about other projects of this kind, it may be useful to budget for some common marketing activities in each venue in which the show is presented. This approach would significantly increase the cost of launching a project like OWOS, but it might assure larger and broader audiences in the communities and countries in which it is shown.

Sixth, we note that this evaluation model was designed to utilize a central evaluation staff for the design of the evaluation and the construction of instruments and the selection of institutions to be studied, but relied on the cooperation of local institutions for assistance in the data collection program. With the benefit of over a year of experience in planning and executing field work, we think that this is a viable model with substantial strengths. The provision of a central field supervisor who traveled to each site provided an important external check on data quality and integrity and the use of local interviewers provided an interviewing staff that was familiar with the institution and its resources. Our experience recommends this approach as a general model for the evaluation of complex national operations in numerous venues across the country.

Finally, despite the challenges of cross-national production, dissemination, and evaluation, the results indicate that the One World One Sky show was successful in achieving its basic

objectives. It captured the interest and attention of young children and enabled parents and teachers to use the material for subsequent educational conversations and activities. The high degree of teacher and parent acceptance of the show and the post-viewing activities reported by parents and teachers suggest that a significant level of additional educational activities occurred. There is a strong indication that parents use the Internet and other learning resources to interest their children in science and astronomy. Moreover, the development of OWOS in a cross-cultural context made the experience more effective in stimulating interest and fostering the retention of basic constructs. It was a successful collaborative effort.

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**Appendix A**  
**Evaluation Sites and Protocols**

The evaluation of the One World One Sky show was conducted in a parallel manner in the China and the United States. The basic design called for the selection of sites representing major urban areas and smaller cities and towns. The sample design specified both fixed building planetariums and portable domes from the outset. Because the adoption of the show and the scheduling of actual dates is a rolling process, it was impossible to define a universe of viewing sites at the outset of the distribution of the show and to select from those sites on a probability basis. The sample selection process used a continuously updated list of sites showing OWOS and tried to balance among institutional types and geographic location to produce a broadly representative set of test sites.

In the U.S., the distribution of the OWOS show was managed by the Adler Planetarium in Chicago and the Liberty Science Center in New Jersey. The availability of OWOS was announced through normal planetarium channels and professional meetings. Institutions decided whether they would include the show in their program offerings and when to schedule it. Over a period of about 12 months, the following sites were selected for evaluation testing and agreed to participate:

1. Adler Planetarium, Chicago, Illinois.
2. Smithsonian Air and Space Museum, Washington, D.C.\*
3. State Museum and Planetarium, Trenton, New Jersey.
4. Carnegie Science Center, Pittsburgh, Pennsylvania.\*
5. Fort Worth Museum of Natural History, Fort Worth, Texas.
6. Two private Catholic schools in the Chicago area using a portable dome and projector.\*

\*These planetariums were able to provide the OWOS experience through support from PNC Foundation grants.

A field supervisor was trained by Professor Miller at the Adler Planetarium and managed all of the data collection in the U.S. Each of the participating institutions provided local staff to assist in the interviews and was compensated by the central evaluation office for all staff expenses (wages, benefits, and local supplies). Follow-up telephone calls were made centrally from Michigan State University and the University of Michigan.

In China, the field work and evaluation were supervised by Professor Li Daguang, a professor of science communication at the Graduate University of the China Academy of Sciences in Beijing. Professor Li made the arrangements with each site and employed students from his university to travel to the site and conduct student, parent, and teacher interviews for the evaluation. Although Sesame Workshop and the Adler Planetarium worked with their Chinese colleagues to produce multiple versions of OWOS to work with various kinds of projection equipment, the field work in China was complicated by the number of local planetariums that had older equipment that was incompatible with the formats in which the OWOS show was available. With the cooperation of the Dr. Zhu at the Beijing Planetarium and the leadership of the China Association for Science and Technology (CAST), Professor Li was able to collect evaluation data from the following sites:



1. Beijing Planetarium, Beijing
2. Shanghai Children's Palace, Shanghai
3. Nanjing Planetarium, Jiang Su Province
4. Donghai Science Museum, Lian Yun Gang City, Jiang Su Province
5. Xiamen Planetarium, Fujian Province
6. Kunming Planetarium, Yun Nan Province
7. Beijing No.57 Middle School Planetarium, Beijing (dome)

To encourage local cooperation, the OWOS show was made available to participating local planetariums without charge. Chinese institutions do not engage in advertising and marketing to the same extent as U.S. institutions, but they have a very effective system of informal word-of-mouth dissemination that works through parents and teachers. The net result was that all of the sites attracted a large number of parents and classes that were broadly representative to the communities in which they were located.

**Appendix B**  
**Questionnaires**

## Child (with class) Pre-show Questionnaire (US version)

Interviewer:

The teacher of the child named below has agreed that this child may be interviewed prior to seeing the planetarium show and immediately after the show. Please ask the following questions and record the answers on this form. There is a section at the end of the questionnaire for any additional comments or information that you think is important in coding and editing the child's responses.

Name of child: \_\_\_\_\_ Case number: \_\_\_\_\_

Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello, my name is \_\_\_\_\_ and I want to ask you a few questions before you see this show. The questions will help us know more about how much you like this show and will take just a few minutes. OK?

IF NAME OF CHILD IS NOT ALREADY ENTERED ABOVE, ASK: What is your name? **Enter above**

What grade are you in?

Enter grade ►

What is the name of your school?

Enter name ►

Do you have a television at home? No

Yes  What is your favorite television show? **Enter answer below**

How often do you watch that show?

- All the time  
 Sometimes  
 Never

**SHOW CHILD PICTURE OF BIG BIRD**

Have you ever seen this character before?

No

Yes  What is his name? **Enter name below**

Have you ever watched a show called Sesame Street?

No

Yes  How often do you watch Sesame Street?

- All the time  
 Sometimes  
 Never

Now, let me ask you about a few things that you might have done with your parents or with students at school.

First, tell me some things that you know about the Sun? [What else?]

Enter responses ►


Is the Sun a star, a moon, or just a very bright planet?

- a star
- a moon
- a very bright planet
- does not know

Have you ever seen the Moon at night? No

Yes

Tell me some things you know about the Moon. [What else?]

Enter responses ►


Do you think that there are a lot of trees on the Moon, just a few trees on the Moon, or no trees on the Moon?

- a lot of trees
- just a few trees
- no trees
- does not know

Have you ever looked at the stars at night? No

Yes

Tell me some things you know about the stars. [What else?]

Enter responses ►


Have you ever heard of something called the Big Dipper?

No

Yes  What is the Big Dipper?

Enter response ►

--

How do you say "Star" in Chinese?

Incorrect

Correct

**Interviewer: The correct pronunciation is "shing-shing." Please check box on the left.**

What do you know about China?

Enter response ►

Do people in China and people here in [name of city] see the SAME stars at night or DIFFERENT stars?

- Same stars  
 Different stars  
 Does not know

Have you ever visited a zoo before to look at animals?

No

Yes  About how many times have you visited a zoo?

Enter number ►

Have you ever visited an aquarium before to look at fish?

No

Yes  About how many times have you visited an aquarium?

Enter number ►

Do you have a computer at home?

No

Yes  Are you allowed to use it sometimes?

No

Yes  About how many times a week do you use it?

Enter number ►

Thank you for talking to me. I would like to talk to you for a couple of minutes more after you see the show, so please wait for me – with your teacher – after the show. OK?

**Interviewer: Please complete the following items after the end of the interview and after you have returned the child to his or her parent or guardian.**

Did this child understand all or almost all of the questions?

Yes

No

Did this child pay attention to the questions and provide serious responses?

Yes

No

Was a teacher present for any part of the interview?

Yes

No

Please provide any additional information about this interview that may be useful in understanding it:

## Child (with class) Post-show Questionnaire (US version)

Interviewer:

Please re-enter the name of the child and case number in the appropriate spaces below. Please re-enter the date and your identification number. Remember that we have provided space at the end of the questionnaire for any additional comments or information that you think is important in coding and editing the child's responses.

Name of child: \_\_\_\_\_ Case number: \_\_\_\_\_

Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello (name of child). Did you enjoy the show?

**SHOW CHILD CARD WITH GRADED SIZES OF SMILING AND FROWNING FACES.**

If this smiling face means that you liked the show a lot (point to largest smiling face) and this frowning face means that you did not like the show at all, which face would be the best one to say how much you liked the show? You can pick any face on this card.

Now, I would like to ask you just a few short questions about the show that you just watched. OK?

Do you think that it was too long, too short, or about right?

Too long  
 Too short  
 About right

Tell me what happened in the show you just watched. What else?

Enter response ►

Before today, have you ever seen Elmo? No   
Yes

What was the name of Elmo's new friend?  Check box if child mentions Hu Hu Zhu

**IF CHILD DOES MENTION HU HU ZHU, SAY:**

Elmo's new friend is named Hu Hu Zhu. What country is Hu Hu Zhu from?

Check box if child mentions China; otherwise record response ►

Tell me some things that you learned about the Sun. [What else?]

Enter responses ►

## Child (with parent) Pre-show Questionnaire (US version)

Interviewer:

The parent of the child named below has agreed that this child may be interviewed prior to seeing the planetarium show and immediately after the show. Please ask the following questions and record the answers on this form. There is a section at the end of the questionnaire for any additional comments or information that you think is important in coding and editing the child's responses.

Name of child: \_\_\_\_\_ Case number: \_\_\_\_\_

Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello, my name is \_\_\_\_\_ and I want to ask you a few questions before you see this show. The questions will help us know more about how much you like this show and will take just a few minutes. OK?

IF NAME OF CHILD IS NOT ALREADY ENTERED ABOVE, ASK: What is your name? **Enter above**

Do you go to school?

No

Yes  What grade are you in?

**Enter grade ►**

Do you have a television at home?

No

Yes  What is your favorite television show? **Enter answer below**

How often do you watch that show?

All the time

Sometimes

Never

**SHOW CHILD PICTURE OF BIG BIRD**

Have you ever seen this character before?

No

Yes  What is his name? **Enter name below**

Have you ever watched a show called Sesame Street?

No

Yes  How often do you watch Sesame Street?

All the time

Sometimes

Never

## Child (with parent) Post-show Questionnaire (US version)

Interviewer:

Please re-enter the name of the child and case number in the appropriate spaces below. Please re-enter the date and your identification number. Remember that we have provided space at the end of the questionnaire for any additional comments or information that you think is important in coding and editing the child's responses.

Name of child: \_\_\_\_\_ Case number: \_\_\_\_\_

Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello (name of child). Did you enjoy the show?

**SHOW CHILD CARD WITH GRADED SIZES OF SMILING AND FROWNING FACES.**

If this smiling face means that you liked the show a lot (point to largest smiling face) and this frowning face means that you did not like the show at all, which face would be the best one to say how much you liked the show? You can pick any face on this card.

Now, I would like to ask you just a few short questions about the show that you just watched. OK?

Do you think that the show was too long, too short, or about right?

Too long  
 Too short  
 About right

Tell me what happened in the show you just watched. What else?

Enter response ►

Before today, have you ever seen Elmo? No   
Yes

What was the name of Elmo's new friend?  Check box if child mentions Hu Hu Zhu

**IF CHILD DOES MENTION HU HU ZHU, SAY:**

Elmo's new friend is named Hu Hu Zhu. What country is Hu Hu Zhu from?

Check box if child mentions China; otherwise record response ►

Tell me some things that you learned about the Sun. [What else?]

Enter responses ►



## Some Questions about Your Child

Dear Parent,

You and your child have been selected randomly to participate in an evaluation of the show that you are about to see. In order to know if this show is useful to you and your child, we need to ask some parents and their children to tell us something about their background prior to seeing this show and to talk with us after the show about what they saw. We would also like to be able to call you on the telephone or send you some questions by email in about a month concerning this show and anything that may have happened in the month after this experience that might be related to this show. We will give your child a Sesame Streetpostcard as a gift for participating in this evaluation. If you agree to participate in this evaluation and to allow one of our young people to interview your child for about 10 minutes, please check the box below and sign your name in the space provided.

I agree to participate in this evaluation and to allow my child – named below – to participate in this study.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of child: \_\_\_\_\_ Age of child \_\_\_\_\_

Your relationship to this child: \_\_\_\_\_

Is this child currently enrolled in: (Please check one box)

Day care but not school

Kindergarten

First grade of school

Second grade of school

We thank you for your agreement to participate.

First, a few questions about you and your own interests. How interested are you in each of the following subjects. Please indicate your response using a zero-to-10 scale, with 0 meaning that you are not at all interested and 10 meaning that you are very interested.

	Enter 0 to 10
Science	<input type="text"/>
Astronomy	<input type="text"/>
Mathematics	<input type="text"/>
Sports	<input type="text"/>
Health and exercise	<input type="text"/>
Food and cooking	<input type="text"/>
Learning about other countries and cultures	<input type="text"/>

**Please turn to the back of this page to continue**

## Some Questions about the Show

Name of Parent: \_\_\_\_\_

Name of Child: \_\_\_\_\_

We hope that you and your child enjoyed the show. To help us make this and future shows more useful to you and your family, we need to ask you for a few of your first reactions to the show. These questions should take only three or four minutes.

First, please indicate how much you agree or disagree with each of the following statements. Please indicate your response using a zero-to-10 scale, with 0 meaning that you disagree completely with the statement and 10 meaning that you agree completely with the statement.

Enter 0 to 10

The overall quality of this show was very high.

The show had a lot of educational value for my child.

This show got my child excited about learning about the sky.

This show had too much entertainment and not enough science.

I will use some of the material from this show to talk to my child about the sky.

I will look for other educational materials to help my child understand more about this subject.

I will recommend this show to other parents.

The facility was clean and comfortable.

The seating was comfortable.

I will bring my child back here again for other shows.


To understand how a show like the one that you have just seen influences parents and children, we would like to contact you again in about one month to ask you a few more questions about things that you or your child may have done since seeing this show. The follow-up call will take about 10 minutes. We need your help in reaching you. It would be most helpful if you would be willing to share your telephone number and – if you have one – your email address. We will treat this information confidentially and will use it only to contact you.

The best telephone number to reach me is

I would prefer to be called  in the evening during the week

on Saturday afternoon

on Sunday afternoon

another time (\_\_\_\_\_)

My email address is:

**Thanks again for your help!**

## Follow-up Parent Interview (telephone version)

Interviewer:

Please call the parent named below and read the interview script and collect the parent's responses. Remember that a good telephone interview is a conversation and try to ask the questions in a natural and conversational way. It is important, however, that you do not change the wording, order, or content of any of the questions.

Name of parent: \_\_\_\_\_ Case number: \_\_\_\_\_

Name of child: \_\_\_\_\_ Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello, my name is \_\_\_\_\_ from the [name of planetarium]. May I speak to [name of parent]?

**WHEN SPEAKING TO PARENT:** Hello, my name is \_\_\_\_\_ and I am calling to follow-up on an interview that we had about six weeks ago when you and [name of child] attended a planetarium show at [location]. Do you recall being interviewed when you visited the [name of planetarium]?

The purpose of this call is to ask you a few questions about the show that you and [name of child] watched at the [name of planetarium or place] a month or so ago. You may recall that we asked you a few questions immediately after the show, but we find that at few weeks later many people have thought about the show and have useful ideas or thoughts about the show. This show is a new production and we are very interested in asking you a few more questions about the show now that you have had more time to think about it.

This interview will take about 10 minutes. Is this a good time to talk? **IF NOT, MAKE APPOINTMENT.**

First, thinking back to the show, how would you rate its educational value? Please think of a zero-to-10 measure, with zero meaning that you think it had no educational value and 10 meaning that it had a great deal of educational value. You can select any number between zero and 10 to indicate your feeling about the educational quality of the show. How would you rate the educational quality of the show?

Enter score ►

Can you tell me some of the reasons for your rating of the show?

Enter response ►

Thinking back over the last month since you and [name of child] saw the show, have you and [name of child] talked about the content of the show?

No

Yes  About how many times have you and [child] talked about the show itself or about any of the ideas in the show?

Enter number ►

Can you tell me any of the subjects that you and [child] talked about in regard to this show?

Enter response ►

## Some Questions about Your Class and School

Dear Teacher,

You and your class have been selected randomly to participate in an evaluation of the show that you are about to see. In order to know if this show is useful to you and your class, we need to ask you and a few of your students to tell us something about their background prior to seeing this show and to talk with us briefly after the show about what they saw.

We would also like to be able to call you on the telephone or send you some questions by email in about a month concerning this show and anything that may have happened in your class in the month after this experience that might be related to this show. The follow-up call will take about 10 minutes. We will give each student in your class a Sesame Street pencil as a gift, although we will be able to actually interview only a portion of your students for this evaluation. We need to select these students randomly and need your help in making the selection. If you agree to participate in this evaluation and to allow our interviewers to talk to a few of your students for about 5 minutes, please check the box below and sign your name in the space provided.

I agree to participate in this evaluation and to allow my students to participate in this study.

Teacher Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of school: \_\_\_\_\_ Grade/Level \_\_\_\_\_

Number of students in this class: \_\_\_\_\_

Thank you for your agreement to participate.

First, a few questions about you and your teaching background. For each question below, please enter the appropriate number in the box to the right of the question.

	Enter number
How many years have you been employed as a teacher?	<input type="text"/>
How many years have you taught at this grade level?	<input type="text"/>
During this school year, how many times have you taken your class to visit a planetarium?	<input type="text"/>
During this school year, how many times have you taken your class to a science museum?	<input type="text"/>
During this school year, how many times have you discussed astronomy in class?	<input type="text"/>
What percentage of your students are able to read?	<input type="text"/>

Prior to today's visit to the planetarium, did you prepare your students in any way for this visit?

No

Yes

Please describe in the space below what you did to prepare your students for today's visit?

Did you download the Teacher guide or any of the curriculum materials before today's visit?  Yes  
 No

Thanks again for your help!

## Some Questions about the Show

Name of Teacher: \_\_\_\_\_

Name of School: \_\_\_\_\_

We hope that you and your students enjoyed the show. To help make this and future shows more useful to you and your students, we need to ask you for a few of your first reactions to the show. These questions should take only three or four minutes.

First, please indicate how much you agree or disagree with each of the following statements. Please indicate your response using a zero-to-10 scale, with 0 meaning that you disagree completely with the statement and 10 meaning that you agree completely with the statement.

	Enter 0 to 10
The overall quality of this show was very high.	<input type="text"/>
The show had a lot of educational value for my students.	<input type="text"/>
This show got my students excited about learning about the sky.	<input type="text"/>
This show had too much entertainment and not enough science.	<input type="text"/>
I will use some of the material from this show to talk to my students about the sky.	<input type="text"/>
I will look for other educational materials to help my students understand more about this subject.	<input type="text"/>
I will recommend this show to other teachers.	<input type="text"/>
The facility was clean and comfortable.	<input type="text"/>
The seating was comfortable.	<input type="text"/>
I will bring my students back here again for other shows.	<input type="text"/>

To understand how a show like the one that you have just seen influences teachers and students, we would like to contact you again in about one month to ask you a few more questions about things that you or your students may have done since seeing this show. The follow-up call will take about 10 minutes. We need your help in reaching you. It would be most helpful if you would be willing to share your telephone number and – if you have one – your email address. We will treat this information confidentially and will use it only to contact you.

The best telephone number to reach me is

- I would prefer to be called  in the evening during the week  
 on Saturday afternoon  
 on Sunday afternoon  
 another time (\_\_\_\_\_)

My email address is:

**Thanks again for your help!**

## Follow-up Teacher Interview (US telephone version)

Interviewer:

Please call the teacher named below and read the interview script and collect the teacher's responses. Remember that a good telephone interview is a conversation and try to ask the questions in a natural and conversational way. It is important, however, that you do not change the wording, order, or content of any of the questions.

Name of teacher: \_\_\_\_\_ Case number: \_\_\_\_\_

Name of school: \_\_\_\_\_ Date of interview: \_\_\_\_\_ Interviewer Number: \_\_\_\_\_

Hello, my name is \_\_\_\_\_ from the [name of planetarium]. May I speak to [name of teacher]?

**WHEN SPEAKING TO TEACHER:** Hello, my name is \_\_\_\_\_ and I am calling to follow-up on an interview that we had about a month ago when you and your class attended a planetarium show at [location]. Do you recall being interviewed when you visited the [name of planetarium]?

The purpose of this call is to ask you a few questions about the show that you and your students watched at the [name of planetarium or place] about a month ago. You may recall that we asked you a few questions immediately after the show, but we find that a few weeks later many teachers have thought about the show and have useful ideas or thoughts about the show. This show is a new production and we are very interested in asking you a few more questions about the show now that you have had more time to think about it.

This interview will take about 10 minutes. Is this a good time to talk? **IF NOT, MAKE APPOINTMENT.**

First, thinking back to the show, how would you rate its educational value? Please think of a zero-to-10 measure, with zero meaning that you think it had no educational value and 10 meaning that it had a great deal of educational value. You can select any number between zero and 10 to indicate your feeling about the educational quality of the show. How would you rate the educational quality of the show?

Enter score ►

Can you tell me some of the reasons for your rating of the show?

Enter response ►

Thinking back over the last month since you and your students saw the show, have you and your students talked about the content of the show in class?

No

Yes  About how many times have you and your students talked about the show itself or about any of the ideas in the show in class?

Enter number ►

Can you tell me any of the subjects that you and your students talked about in regard to this show?

Enter response ►