

**ENHANCING THE VISITS OF
MIDDLE-SCHOOL TOUR GROUPS
TO THE SMITHSONIAN**



Smithsonian Institution

**Office of Policy and Analysis
January 2007**

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A DIFFICULT, BUT REWARDING CHALLENGE

Tour groups of middle-school students are one of the Smithsonian's largest audiences—particularly in the spring, when the museums host hundreds of these groups. Often they arrive unannounced, with little preparation in terms of background knowledge, orientation to the facilities, or understanding of museum etiquette. They may or may not be chaperoned by teachers and parents. They have high energy levels and want to have fun with their friends. They can be unruly, noisy, and disruptive, particularly when in large groups. Many see the trip more as a break from school than as an opportunity for learning. They are a demanding audience, and Smithsonian museums often lack the resources to provide the kind of personalized programming to which they respond best.

It might be asked why, given the difficulties of serving middle-school tour groups, the Smithsonian should invest in them. The obvious answer is that they are a significant audience, and the Smithsonian has an obligation to serve them as it does other audiences. Another, based on data on Smithsonian educational offerings, is that this audience is least-served by museum programs.

More important, however, are the potential rewards of engaging with this audience. They are at a stage in their lives when effective programming can have a big impact. While self-absorbed, middle-school students are also becoming conscious of the world around them and their place in it. They are beginning to think beyond themselves to issues of social justice, environmental degradation, personal values, and the link between past, present, and future. While they come to the Smithsonian wanting to have fun, for the most part they also accept that they are expected to learn something. And they will learn if engaged appropriately. Equally important, the quality of their experience at the Smithsonian may significantly influence whether they choose to become lifelong museum-goers on their own and with their children.

STUDY BACKGROUND

SCOPE

The Smithsonian recently established a competitive grant program, administered by the Smithsonian Center for Education and Museum Studies (SCEMS), to support projects aimed at enhancing the visits of school tour groups. As part of that initiative, in September 2006 SCEMS contracted with the Smithsonian Office of Policy and Analysis (OP&A) to research possible ways to enhance visits to Smithsonian museums by middle-school tour groups specifically. The information resulting from the OP&A study team's research was to be made available to Smithsonian educators who might be interested in developing grant proposals for projects targeting this audience. The information will also support the efforts of tours operators to enhance their tours for this audience. Because of a January deadline for grant applications, the study team was asked to complete its research, analysis, and report preparation within a timeframe of approximately two months.

METHODOLOGY

The OP&A study team obtained information from three sources:

- Visits to the Smithsonian by three middle-school and high-school tour groups to Washington, DC in the months of October and November 2006.¹ The study team used three approaches to study these tours: a survey of the students²; discussions

¹ The duration of the Smithsonian stop on the three tours studied was about two hours per museum.

² The low number of tours and students available to study during the timeframe of the project was not conducive to administering a formal survey. Instead, the OP&A study team chose to survey all students on the three tours to get their opinions of their visit. The results are representative solely of the students who were surveyed and are not representative of the wider population of middle-school-aged Smithsonian visitors in organized tour groups.

with individual students or small groups of three to five students; observation of subgroups of two to six students;³ and audio recordings of students.⁴

- Interviews with eleven Smithsonian educators at five Smithsonian museums; three managers/staff of a tour operator; and three tour directors.

- A literature review. The study team focused on the literature dealing with school tours to museums and the characteristics of the middle-school age cohort. The team discovered there is virtually no literature on commercial tours to museums, and very little that specifically addresses visits by out-of-area school groups. Instead, the literature mainly addresses elementary-school students. The literature also looks largely at natural history museums, science centers, and, to a lesser extent, art museums.

The tour operator also administered a modified survey questionnaire, on behalf of the study team, to a high-school tour group visiting the Metropolitan Museum of Art in New York.

It is important to note some of the limitations of the preceding methodologies, most of which emerge from the short timeframe for the study. The necessarily quick startup and small number of tours did not permit the study team to pretest the survey instrument and use of the tape recorders as thoroughly as it would have preferred. The three tour groups may not be typical of the more numerous ones that come in the spring and early summer, if only because the number of students involved was much smaller. The study team wanted to talk to teachers and chaperones on the tours and to follow up with some students, but arranging such interviews was logistically not possible. Finally, the study did not involve a review of the spectrum of offerings at the Smithsonian applicable to

³ For logistical reasons the study team observed the groups only when visiting the National Air and Space Museum.

⁴ The study team handed out four recorders to each tour group and asked the students to record their impressions of the visit. This effort was not wholly successful because of background noise and students' failure to speak directly into the recorders.

middle-school tour groups specifically or interviews with staff at other museums to discuss their approaches to such groups.

Because of these limitations, the study team did not feel comfortable drawing definitive conclusions or making specific recommendations. However, the information the study team gathered was sufficient to allow the identification of a number of issues that impact the effectiveness of middle-school student tours; strategies to address them; and point to areas that might benefit from further study. The next section contains the OP&A study teams observations.

ORGANIZATION OF THE REPORT

The first part of this report presents the study team's overall observations about what makes for a successful tour, based on the literature review, what it came away with from looking at the three tour groups, and the interviews. The second part contains the findings from the literature review, study of the three tour groups, and interviews with Smithsonian educators. Appendix A presents the bibliography of literature reviewed for the study. Appendix B highlights some relevant programs at other museums that emerged from the literature review.

OBSERVATIONS

This section highlights the key factors that make for successful visits by middle-school tour groups to museums, ending with a brief discussion of some issues that bear on efforts by Smithsonian museums and tour operators to enhance such visits. It should be kept in mind when reviewing the information in this report that what constitutes “enhancement” or needs to be “enhanced” is not defined. One of the most difficult aspects of programming for middle-school students is determining what precisely constitutes “success” or “effectiveness.” What measures or standards should be used? How realistic are these measures, given available resources? Whose definition of success or effectiveness should be applied—the students’, teachers’, school systems’, museums’, or tour operators’?

ELEMENTS OF SUCCESSFUL TOURS

ADEQUATE PLANNING AND PREPARATION

Understanding the Audience

Serving middle-school tour groups effectively requires that tour operators and Smithsonian educators be responsive to the needs of middle-school students themselves and the agendas of their teachers and schools. In developing offerings, some museums employ advisory groups of teachers and students to identify needs and interests, and to review materials and programs. Formative evaluations with target audiences of offerings under development can also be useful; such evaluations reveal students’ levels of knowledge, misconceptions, and interests. Evaluations work best when continued throughout the program or exhibition development.

Planning the Visit

Good planning is a cornerstone of an effective tour. The starting point is to develop realistic goals for the visit, consistent with the purpose of the trip, the time available, and the attention span of middle-school museum-goers. The latter consideration brings up the trade-off between providing students with maximum exposure to new things and offering a more relaxed, focused agenda. Many experts believe the latter approach is more conducive to learning, and that students have a better experience when they focus on a small number of objects or displays—say, five or so—at least for the structured component of a museum visit.

Ideally, planning is done collaboratively by the tour operator, teachers, museum educators, and students. Realistically, however, involvement by museum educators is unlikely to happen when the school is outside the museum's service area. Tour operators have more opportunity to work with teachers, but it appears that most teachers do not engage in more than cursory, largely logistical, planning. Thus, museum educators and tour operators may need to develop their own plans with minimal input from teachers.

There is often a disconnect between teachers' emphasis on learning that is linked to the curriculum and classroom, and what actually happens with the museum visit. Many visits are quite unstructured, with few formal efforts to relate what students see and do to their classroom work. It appears that post-visit activities aimed at consolidating student learning are more the exception than the rule. This disconnect suggests two implications:

- First, when developing programs, museum educators might want to include a formal onsite learning component that does not rely on pre- and post-visit classroom activities. For example, it may be helpful to include some activity akin to the post-tour activity used by the Smithsonian American Art Museum (SAAM). Following the tour, the docent takes the students to a room where they engage in activities that encourage reflection about what the students saw and did.

- Second, museum educators might want to focus scarce resources on tour groups where they are most likely to have an effect. For example, tours undertaken to celebrate the completion of the academic year might not merit the attention of a trained facilitator. On the other hand, if a teacher is very motivated to achieve specific learning outcomes, the museum might work with him or her to develop a structured, resource-rich, 45- or 60-minute program that includes inquiry-based learning, facilitated discussion, and post-visit follow-up activities.

Preparing for the Visit

Another area of consensus is the importance of visit preparation to familiarize students (and chaperones) with the purpose of the visit, what they will see, the educational goals of the visit, and the learning processes that will be used. Also important for all participants, including the teacher, is orientation to the museum itself—its purpose, content, themes/messages, and physical layout—and to proper behavior in the museum. This type of preparation helps students adjust quickly to the new setting so they can move forward with the educational agenda of the visit.

Optimally, teachers, tour operators/directors, and museum educators should collaborate to devise appropriate pre-visit materials and exercises geared to the specific goals of particular groups. The reality, however, is that collaboration with teachers from out of town is difficult to accomplish. Many teachers do not engage in pre-visit preparation at all. Thus, museum educators and tour operators may need to take on greater responsibility for such preparation. Examples of how this might be done include mailing materials directly to students and their families, offering a video introduction to the Smithsonian on the bus en route to the museum, or providing a brief orientation upon arrival. The National Museum of the American Indian reports success with the five-minute orientation it provides groups when they arrive, and some non-Smithsonian museums provide presentations (optimally combined with artifacts and audience participation) at the start of a visit that serve both to orient and motivate visiting students.

Finding the Right Space

Having space available for tour groups is important to improve students' focus, facilitate social interaction and discussion, and minimize disruption to other visitors. Some museums offer dedicated space for student groups, while others simply make use of public spaces—for example, at the museum entrance or within a gallery. The latter is more feasible at most Smithsonian museums. In any case, it is best to work with students in proximity to exhibitions, rather than in a remote classroom-like environment.

Because crowding is a problem at some Smithsonian museums, it may be preferable to engage students in the structured component of their visit in less crowded galleries or spaces, leaving the icons for the students to see during the free-time component of their visit. Tour operators/directors could work with the museum to identify quieter and less crowded venues to include in their tours.

WHAT ENGAGES MIDDLE-SCHOOL STUDENTS

As noted, the study team found little literature on middle-school museum tour groups from out of town. However, much of what is known about visits by local school groups applies to tour group visits as well. The key differences for the latter are that the Smithsonian is typically just one stop among many in the nation's capital, and there may be a significant novelty factor to the visit that, if not addressed, detracts from students' ability to focus on the educational goals.

The starting point in developing strategies and programs is understanding what engages a middle-school audience, and what does not. The literature broadly supports the following generalizations. Middle-school students:

- Prefer a facilitated (inquiry-based) approach to learning, and are turned off by a didactic (lecturing) approach. They are more likely to learn from experience-driven and interactive approaches than from information-driven approaches.
- Like to have some control over the visit and the learning process, as opposed to having others tell them what to see and do.
- Want to make connections between what they see in the museum and their own lives. Likewise, they want to see connections to current global issues such as social justice, the environment, and war.
- Want opportunities for social interaction and fun. These need not be antithetical to learning.
- Want a physically comfortable environment—which includes everything from ease of wayfinding and movement to adequate lighting and easy-to-read text.

STRATEGIES

The preferences discussed above have a number of implications for strategies to engage middle-school tour groups.

Conceptualizing Exhibitions and Programs

If museums want to engage middle-school students in their offerings, they will need to think in terms of exhibitions and programs that provide age-appropriate opportunities for this audience to

- Explore the world through interactive, sensory experiences;

- See themselves as participants, rather than as observers;
- Find personal connections to the exhibition or program content; and
- Respond emotionally and intellectually to what they have seen both.

Topics such as current fashion, music, film, language, and accomplishments of peers are all of interest to middle-school students because they tie in to identity formation and to the here-and-now. By contrast, programs that do not make a clear connection to students' individual lives or to the world in which they live will not engage them. Middle-school students also like displays that pose provocative ideas, challenge established values, and raise questions about current norms. The addition of text that raises such issues to existing exhibitions might make these exhibitions more engaging to this age group.

Incorporating Social Interaction and Fun

Middle-school students are extremely social, so approaches that involve group interaction are preferable. Peer-mediated learning—engaging students in discussions among themselves, having them share their thoughts on what they see, and having them teach what they know to others in the group—is effective with this group.

Likewise, students in this age group want fun experiences, and museum educators and tour operators must recognize that learning and fun are not mutually exclusive. To the contrary, middle-school students find learning tools such hands-on activities, interactives, media, and immersive experiences to be fun *and* educational. What they do *not* like are strategies that smack of the classroom, such as lectures and fact-finding worksheets.

Allowing for Choice and Control

Middle-schoolers want some choice over what they see and do, and like to have some control over the learning process. To meet these requirements, tour operators might work

with teachers to allow students some choice about which museum to visit, what exhibitions to see within a museum, what activities to participate in, and what themes to focus on. Museum educators might consider offering a choice of activities such as writing, drawing, or talking about what they have seen, and a choice of themes, such as science, technology, history, women's accomplishments, and diverse cultures.

Smithsonian museums and tour operators/directors together might consider developing series of themed mini-tours, each focused on a small set of objects, concepts, or displays, from which students could choose. The National Air and Space Museum (NASM) has taken this approach with some recently-developed self-guided tours, although these have not been well-publicized to school tour groups. The OP&A study team believes that to meet the needs of middle-school tour groups at the current level of resources, the museums will probably have to rely more heavily on self-guides.

The study team believes that more choice would have benefited the three tours it observed. A number of the students were simply not interested in NASM's subject matter, and might have found other museums more engaging. Even if the option of visiting other museums is not practical, offering students a choice of themed tours within a museum like NASM might stimulate greater interest for some students, not to mention assisting them in coping with the vastness of the museum.

Studies show that students prefer museum visits with family over school trips, in large part because family visits allow choice, freedom of movement, and control over what is seen and done. Educators might want to study family group visits to see what features might be carried over to school programs.

Structured and Free Time

Related to choice and control, visits for middle-school students work best when they offer both a structured component and a period of time when students can explore on their own. A structured component helps students both to focus on the learning part of the trip

and become acculturated to an unfamiliar setting. For this age group, the optimal duration of the structured component is around 45 minutes. Ideally, the structured component has clear links to classroom work and is facilitated by knowledgeable staff. However, the structured component can be self-guided; when this is the case, it should have a clear agenda that focuses on a limited number of displays, involves group activities, and provides questions designed to generate discussion and facilitate personal connections.

Based on both the literature and the study team's observations, there appears to be a need for greater realism concerning the amount of time that should be allocated for a museum visit. Often, students have more time than they can use effectively. For example, the students observed by the OP&A study team had around two hours for their visit at NASM, and most finished exploring the galleries within the first hour. The last hour or so was spent aimlessly. It seems that an hour to an hour-and-a-half at most would work best.

Interaction with Adults

Adults who interact with middle-school tour groups (such as museum staff, docents, or other volunteers) will benefit from training in how to interact with children in this age range. Also important is to have adults who *want* to do so. Many of the students to whom the study team spoke had vivid recollections of adults who talked down to them, lectured them, failed to solicit their views and ideas, and otherwise made an unfavorable impression.

Typically, staff with the skills needed to facilitate visits by middle-school students are among the museums' scarcest resources. Smithsonian museums might want to explore creative ways to augment these resources. One possibility is training college students to serve as paid facilitators; the National Portrait Gallery (NPG) does this, paying \$50 for a one- to one-and-a-half hour session with around 20 students. Tour operators might be in a better position to absorb such costs than museums; the cost would not amount to a

significant additional expense on a per-student basis. Another approach, used by the Museum of Fine Arts, Houston, is to train volunteer high-school students, who commit to working for a year (see Appendix B); visiting students respond well to docents who seem like peers. A third approach is to station docents at key locations throughout the museum where any visitor can interact with them, rather than having them only lead tours, which limits their availability to the 20 or so people in the group.⁵

Another possibility would be to involve chaperones more formally in learning activities. As the chaperones are typically parents who have an interest in seeing some educational return on their investment in the trip, some might be willing to take a more active role if tour operators or the museums were to define such a role for them and provide them with the resources to play that role. Similarly, parents of students might be asked to work through pre-visit materials with their children.

In the interviews with Smithsonian educators, the question came up of the role the tour director plays during the actual museum visit. The study team does *not* see tour directors playing an active role in the onsite educational component of the visit, as they require that time to complete administrative arrangements and have a break. And only one tour director is available per tour, too few to serve all the students in the group.

Museum educators stressed the importance of adequate adult supervision. This aspect of the visit is one of the hardest for museums to control, but it might be an area where tour operators can have greater influence by working with the adults to get them to accompany the students.

Post-Visit Activities

Where possible, tour operators/directors and/or the museums should work with teachers on creating post-visit activities to reinforce learning. However, given that teachers seem

⁵ As noted, the study did not systematically look at what Smithsonian museums are currently doing to augment their pool of interpreters, but it is not aware of much happening in this area.

to do little in this regard, and the museums are not in contact with many teachers, it may be more realistic for tour operators/directors to take responsibility for this element, since there is typically considerable down time on the bus that could be used to engage the students in discussion or post-visit exercises.

INFORMATION-SHARING ACROSS THE SMITHSONIAN

In the course of interviews with Smithsonian educators, it became apparent to the study team that the museums already have resources in place that are focused on middle-school students or could be adapted for this audience. It was unclear how many of the museums were aware of what their peers were doing, so that they might take advantage of one another's experience. The study team suspects, based on the three tours it observed, that the tour operators/directors are also probably unaware of what resources are available at the individual museums that might benefit their tours. Therefore, some type of information-sharing would be very valuable—such as a central compendium of resources relevant to middle-school tour groups available in Smithsonian museums.

CHALLENGES

Improving the quality of middle-school tour group visits to the Smithsonian is a long-term undertaking that requires steady commitment. Such a commitment must take place within a complex organizational context defined not only by the business plan of the tour operators, but by the museums' strategic plans and the priorities defined therein. For example, making exhibitions more engaging for middle-school students is a critical to enhancing the Smithsonian experience for this audience, but it requires considerable lead time and resources, not to mention periodic updating. The pace of progress depends largely on where this particular goal falls among a museum's priorities.

On the other side, some strategies that museums could pursue for enhancing educational experiences in the museum appear to conflict with tour groups' non-educational objectives and expectations. For example, teachers and students on a tour typically want to pack as much into the tour as possible, even though this may not be conducive to effective learning. As a case in point, the study team's observations raised the question of whether a large and crowded museum such as NASM is the best initial stop for a group of tired students unfamiliar with the Smithsonian and unaccustomed to a large city.

Some strategies may require close collaboration between the museums and tour operators, which means treading new organizational ground. The study team believes that collaboration between the museums and tour operators offers significant potential for developing resources and programs that can improve middle-school tour groups' educational experience. However, the team also would caution that realistic expectations are needed about how much Smithsonian museums can do to support enhanced visits for middle-school students. The Smithsonian is obligated to serve a range of audiences with ever-scarcer resources, a budgetary reality that may limit what it can do on its own for specific audiences.

A final point is that while Smithsonian educators are familiar with museum and object-based learning, it is unclear how many have in-depth specific knowledge of the middle-school audience and how to engage it. Moreover, implementing even the best-designed programs for tour groups requires support from teachers, who—no matter how well-intentioned—often do not have the time to plan school tours effectively or to undertake pre-visit preparation and post-visit activities.

FINDINGS

The findings are presented in three parts. The first looks at what the literature says about informal learning by middle-school students and about school tours, as well as presenting some comments by Smithsonian educators about this audience. The second part offers a summary of the results of the study of the three tour groups. The third part looks very broadly at what the Smithsonian currently offers to this audience and at what Smithsonian educators would like from tour operators that bring middle-school students to their museums.

WHAT THE LITERATURE SAYS ABOUT MUSEUM LEARNING BY MIDDLE-SCHOOL STUDENTS

WHO ARE THESE MIDDLE-SCHOOL STUDENTS?

Middle-school students descend on the Smithsonian by the thousands throughout the school year, particularly during the spring. They are part of Generation Y, a cohort with distinctive characteristics, as the literature discusses (see, for example, Kelly and Bartlett 2000, Savage and French 2002, and the literature on Generation Y) and as Smithsonian educators attest.

Personal identity is a central concern. Middle-school students are in the process of maturing. They are intensely interested in developing their personal identity, which involves such things clothing, body art (tattoos and body piercings), language, occupational or leisure interests, and values linked to identity. This search for personal identity involves:

- **Discovering and developing talents, skills, and interests.** Middle-schoolers want to do something well and be valued for it by those they respect. They are interested in the achievements of their generation. They also tend to be self-conscious and very sensitive to criticism.

- **A desire for more adult experiences.** Middle-schoolers are engaged in exploring a widening world and reflecting on the meaning of their experiences. They are trying to understand their role in society—who they are in relation to global issues.

- **An interest in ideas.** The middle-school years are a “time when it is important for learners to pursue ‘the big ideas’” (Kelly and Groundwater-Smith 2004, p. 14). According to a Smithsonian educator, “*Middle school kids are really developing this sense of morality, of justice, of what’s right and wrong, and who is a victim and who is not. They are questioning authority and everything else.*”

Middle-schoolers want to have choice and to exercise control over their lives. They are, for example, consumers with very clear likes and dislikes and reasons for choosing different products.

Social relationships are paramount in their lives. Middle-schoolers have an intense need for social interaction, and their peers exercise a strong influence on them. Their main source of information is word of mouth. They are far more interested in sharing and comparing experiences with friends and partners than in reading or observing.

Middle-schoolers are far more interested in the present and future than in the past. Many perceive museums to be boring because they are retrospective in their outlook.

INFORMAL LEARNING IN MUSEUMS

Learning: One Goal Among Many

Learning is the most frequently cited goal of a museum visit—particularly in today’s world, with its emphasis on schools’ accountability for achieving academic standards. To get permission for a trip to a museum, teachers must be able to show how it fits in with the curriculum and supports the achievement of academic goals. But teachers have additional reasons for the trips that may be equally or more important—exposing students to new places and experiences, taking them on a patriotic tour of DC, providing them with a change of pace and a fun social experience, and celebrating the completion of a school year (see, for example, Anderson, Kisiel, and Storcksdieck 2006, p. 370). Mackety (2003) reports that among the teachers she studied, the important outcomes of a museum visit for their students included exposure to educational experiences that cannot be duplicated in classroom, development of students’ critical thinking skills, making connections to students’ own lives, and placing students in an environment that encourages exploration because it is “safe to make mistakes.” Bitgood (1994) refers to enjoyment, satisfaction, and inspiring curiosity as goals.

The literature notes a disconnect between the emphasis teachers say they attach to links between the museum visit and their learning goals on the one hand, and teachers’ inattention to the conditions that support achievement of these learning goals (such as pre-visit preparation) on the other. Anderson, Kisiel, and Storcksdieck (2006) note, based on one study, that “Only 23 percent of teachers reported that a successful field trip was one that connected with the curriculum, despite the fact that this was stated as a field trip motivation by the majority of teachers” (p. 370). Thus, the link to the curriculum and emphasis on learning goals appears important principally in terms of getting administrative approval for the trip; once that is secured, interest wanes. Nor does it appear that school administrations are monitoring the results of school tour groups to determine whether learning goals were met. Educators at one museum thought, however,

that this conclusion might apply more to out-of-town school tours than to local school visits.

In broad terms, the goal of the learning that takes place in museums might be characterized as *change*—adding to visitors’ knowledge, altering their attitudes, and even affecting their subsequent actions:

Ultimately, museum learning is about “changing as a person”: how well the visit inspires and stimulates people into wanting to know more, as well as changing how they see themselves and their world both as an individual and as part of a community (Kelly and Groundwater-Smith 2004, p. 2, with reference to Kelly 2001, p. 3⁶).

One Smithsonian educator talked of “*The WOW factor of the Institution—to walk back and say, when I was to DC and had my 8th grade tour, I remember seeing this thing... ..It goes on and inspires other things.*” A positive experience in a school group may lead to lifelong habit of visiting museums.

Further, the literature on informal museum learning generally is in agreement that the learning in museum trips goes beyond the cognitive dimension of facts and figures. It also has affective, motivational, social, kinesthetic, and aesthetic dimensions. “Schauble, et al. (1996, p. 24) remind us that learning in a museum context ‘includes outcomes like an expanded sense of aesthetic appreciation, the development of motivation and interest, the formation and refinement of critical standards, and the growth of personal identity’” (Griffin 2004, p. S60).⁷ Anderson, et al. (2002) note that “The key message for program developers is that children will respond *cognitively, aesthetically, motivationally, and*

⁶ L. Kelly, *Researching Learning and Learning About Research*, a paper presented to the CERG Symposium: Changing Identities, Changing Knowledges, Lindfield, Sydney: University of Technology, Sydney, Australia, February 2001.

⁷ L. Schauble, D.B. Beane, G.D. Coates, L.M.W. Martin, and P.V. Sterling, “Outside the Classroom Walls: Learning in Informal Environments,” in L. Schauble and R. Glaser, eds., *Innovations in Learning: New Environments for Education*, Mahwah, NJ: Lawrence Erlbaum, 1996, pp. 5-24.

collaboratively to a diversity of objects and exhibit elements incorporated in the museum experiences in different ways” (p. 9).

Of course, students on school tours have their own agendas. They accept that the trip has a learning goal, but also, and perhaps more important, they want to have fun with their friends, shop, and take a break from the school routine.

The study team did not find any literature that dealt with the role of tour operators in students’ learning. The interviews with tour operators and directors did not yield specific educational outcomes (either in general or for the Smithsonian portion of the trip) that they hoped to achieve.

How Learning Takes Place in a Museum Setting

Jensen (1994) refers to museum learning as “a self-directed, socially enacted process” (p. 56) that differs for different visitors—following Falk and Dierking (1992)⁸—on the basis of their cultural and socioeconomic background, educational level, and personal learning style, not to mention the social context of their visit and the characteristics of the specific museum. A number of sources talked about the importance to learning of unpredictable critical incidents, or “teachable moments” (see, for example, Lucas 2000). Jensen (1994) concludes that “[through] acting individually and socially [students] construct meaning as they learn. So educators should focus their attention on the learner and his or her relationship to what is being taught rather than on content in isolation from the learner” (p. 56).

Griffin (2004) stresses the balance between giving students leeway to create their own learning experience (including social interaction with peers and adults), and providing a structure that gives this experience educational focus, noting, “The provision of a clear learning framework for the visit, and a clear indication of how the information was to be used following the visit, provide[s] the students with an understandable purpose for their

⁸ J.H. Falk and L.D. Dierking, *The Museum Experience*, Washington, DC: Whalesback Books, 1992.

learning” (p. S66). Among the obstacles that Griffin (2004) identifies to effective learning by middle-schoolers in museums are “activities where there is no obvious reward or motivation for continuing; activities poorly matched to the abilities of the audience ... and activities that preclude social interaction” (p. S62).

In discussing the use of objects, Yenawine (1999) talks of the need for a student-centered approach that allows students to “[examine] them concretely for whatever visual information they can connect to concrete experience from their own lives” (p. 6). Likewise, Sakofs (1984) points out that while objects are crucial to museum-based learning, they do not inherently teach. Rather, “Meaning emerges as a viewer with appropriate background information interacts with the material being viewed” (p. 137).

A number of researchers also point to the importance of a clear link between the museum visit and the classroom and curriculum. For example, educators at the Liberty Science Center identified five elements that contribute to student learning: “(a) alignment with accepted science curriculum standards and benchmarks; (b) extension of all contacts through pre- and post-activity connections; (c) integration with other subjects and disciplines; (d) connection of classroom experience to science center experience; and (e) insistence on student production through problem solving, construction, collaboration, and use of creativity” (Griffin 2004, p. S66, quoting Lebeau, et al., 2001, p. 134⁹).

WHAT BEST SUPPORTS LEARNING BY MIDDLE-SCHOOL STUDENTS

Pre-visit Planning and Preparation

Griffin (2004) notes that pre-visit planning and preparation improve “the chances of learning[,] especially if it involves integration of the school and museum learning and provides opportunities for student involvement” (p. S60). Bitgood (1994) suggests that

⁹ R.B. Lebeau, P. Gyamfi, K. Wizevich, and E. Koster, “Supporting and Documenting Free-Choice in Informal Science Learning Environments,” in J. Falk, ed., *Free-Choice Science Education: How We Learn Outside of School*, New York: Teachers College Press, 2001.

good planning and preparation can often minimize behavior problems and reduce the negative impact of the unfamiliar setting; absent preparation, students tend to focus on coping with the unfamiliar museum environment, not on the learning objectives.

According to Lucas (2000, p. 525), planning and preparation can help ensure that students have appropriate levels of background knowledge, and can include opportunities for students to practice relevant skills ahead of time. Smithsonian educators also stressed the importance of student orientation to enhance the learning process and reduce the time spent adjusting to the setting.

Both researchers and Smithsonian museum educators noted several areas that pre-visit preparation should cover:

- The subject matter and main message(s)/theme(s) of the museum to be visited;
- The layout of the museum;
- Appropriate museum behavior;
- Clear learning goals for the visit, and what students must do to achieve them;
- The logistics of the visit; and
- Advance notice of group problem-solving activities (if teams of students are to work together), so decisions about individual students' roles can be made ahead of time.

A number of experts also talked of the need to involve the students in planning the visit, including content. According to one Smithsonian museum educator, *“In the pre-visit stage, involve the students in the logistics, brainstorm the visit, plan with the kids [their] expected behavior, what the museum experience is, culture shock, etc. ... They need to understand the subject matter. And they can write their own goals.”*

The Role of the Teacher

The literature emphasizes the importance of the teacher in making a museum tour a positive experience. Anderson, Kisiel, and Storcksdieck (2006) state, based on three studies, that “the success of field trips is to a large degree dependent on expectations, prior knowledge, and most importantly, teachers’ prior attitudes towards the setting of the field trip” (p. 381). The literature suggests, and Smithsonian educators agree, however, that teachers do not generally play as effective a role as they should. As one educator said, “*Pre-visit logistics are a big issue. The teachers/coordinators don’t know the museum, and their materials may be 30 years old. ... The visit is doomed if they are not logistically familiar with the museum. The students lose motivation, chaperones lose interest, etc.*”

As many researchers note, teachers often lack the time to prepare relevant teaching materials or to conduct pre-visit activities. Three other factors play a significant part in undermining the effectiveness of teachers in museum-based learning: inadequate communications with the museum; failure to make use of the materials and pre-visit assistance museums provide; and inadequate understanding of and experience with informal museum education.

- **Teacher-museum communication.** A Smithsonian educator noted, “*NMNH did a survey with teachers, asking about the major obstacles. They said money, logistics, and educational standards. But NMNH believes that communication is an obstacle— it can’t give what teachers need until teachers say what they need, and the teachers don’t know what to ask for.*” Although most researchers and museum educators stress the importance of good communications and collaboration between museums and teachers, and teachers say they want assistance from museums, the reality is that this is perhaps the weakest link in the school group visit. Evidence of a failure to communicate is provided by the large number of school groups that arrive at the Smithsonian unannounced. This,

however, appears to be less of an issue with tour operators, who do contact the museums to let them know they are arriving with a group.

- **Teachers' failure to use museum pre-visit resources.** Researchers agree that teachers need museums to provide them with information on how to approach field trips, as well as materials that support field trips. For example, Anderson and Zhang (2003) note that teachers in their study wanted “museum-produced documentation in print that was clear and accessible and, more importantly, showed the links to school-based curriculum ... They wanted a contact person or liaison from the field-trip venue whom teachers could readily access” (p. 10). Within the museum community, a great deal of effort goes into preparing materials for teachers to use in advance of and during the visit. When Smithsonian educators know that a school tour is coming, they often send materials to them; they also refer teachers to materials available online, which may include lesson plans and self-guides. Unfortunately, as one Smithsonian educator noted: “*Teachers and others tend not to use the materials we send out ahead of time.*” Researchers agree this is generally the case. One reason teachers fail to make use of available resources might be that these fail to meet the specific needs of teachers. For example, one Smithsonian educator thought that the materials provided were not optimal for middle-school tour groups. Also, as noted, teachers' objectives for field trips are often less narrowly focused on the educational outcomes that preoccupy museum educators.

- **Lack of teacher training in informal museum learning.** The literature points out repeatedly that teachers in the United States lack training in informal museum learning. Anderson, Kisiel, and Storksdieck (2006) explored whether teachers working at three schools—one in Germany, one in Canada, and one in the United States—had received specific training about field trips as part of their education studies at a university. Only in Germany was field trip pedagogy a regular part of teacher education. The authors concluded, “there is value in helping teachers to become more aware of the varied learning opportunities that can be afforded by

field trip experiences ... field trips can be educationally legitimate even when their focus does not lie predominantly on cognitive objectives related to classroom topics, curriculum or standards” (p. 368). Some museums—including individual Smithsonian museums and the Smithsonian as a whole, through SCEMS—offer teacher workshops on informal museum learning; but these tend to be unsystematic, and it is hard to reach large numbers of teachers through this vehicle. Providing professional development for teachers outside the museum’s immediate area is particularly challenging, and the literature has little to say on how to do it.

Some researchers and Smithsonian educators have tried to identify ways to address the limited role teachers play in preparing for the museum visit. One educator interviewee suggested an orientation DVD or virtual tour. Anderson, Kisiel, and Storksdieck (2006) believe that when developing pre- and post-visit activities, “Museums would be well advised to address the multitude of field trip objectives discussed by teachers, perhaps in conjunction with a teacher advisory group or other formal means to gather teacher input ... [and the museums should support] a range of objectives” (p. 380). Some museums have set up teacher advisory groups (and even student ones) to review programming and other aspects of museum visits. Anderson, Kisiel, and Storksdieck (2006) further suggest that “Museums might also consider how they might more effectively utilize onsite resources to develop experiences that are self-contained and rely less on teacher activities back in the classroom” (p. 381).

What Engages Students in Museums

The study team’s research suggested that the most important factors contributing to a positive museum experience for middle-school students are:

- Providing personal value;
- Allowing choice/control over the visit;

- Offering opportunities for having fun while learning;
- Fostering social interaction with fellow students;
- Interacting with knowledgeable adults; and
- Supporting physical comfort.

Underlying all these factors is that learning must unfold in an interactive way that connects to the students' lives, needs, and interests. They are “[n]ot a group to do things *for*—programs are done *with* this group” (Kelly and Bartlett 2000, p. 2).

Providing personal value. Students of middle-school age want to find personal connections in what they see and do in a museum (Jensen 1994, p. 59 with reference to Henry 1985¹⁰). According to one Smithsonian educator, “*They are just interested in each other and themselves, so you have to relate whatever you’re talking about to them. You have to make that personal connection. If you can’t do that, then you fail.*” Students want opportunities to test their skills and engage with interactives that are appropriate to their age. Kelly and Groundwater-Smith (2004) argue,

In order to be substantively engaged in learning in the museum students need to: know how things work; be able to think through ideas; have opportunities to ask questions; be able to handle, manipulate and closely examine artifacts and exhibits; be able to seek out information from several sources in language that is appropriate to their age and stage of development; be stimulated through various of the senses (p. 9).

¹⁰ C.K. Henry, “A Content Analysis of Student Response Eighteen Months to Three Years after a Structured Museum Experience,” doctoral dissertation, University of Georgia-Athens, *Dissertation Abstracts International* 46:7B.

In one Smithsonian museum, the study team noticed that the interactives tended to be located in just a few galleries. Students spent longer in those spaces and tended to go through galleries with no or limited interactives far more quickly. Students from one tour group the study team observed left a demonstration in *How Things Fly* left before it was over because, as they said later, it was too elementary for them.

Allowing choice and control over the visit. Choice contributes significantly to the personal value of a museum visit, according to many researchers. Griffin (2004) notes that “by providing students with some authority over their learning—giving them a clear agenda and choice in their learning and allowing them the same rights to learn in museums as we afford adults—we know that student learning can be facilitated” (p. S67). Jensen (1994) found the children in one of her studies “value variety as part of museum-going and generally find the single-focus field trips usually planned by teachers to be boring” (p. 71). Further, they “want to look at things at their own pace, to follow their own line of interest ... Children also like that they can negotiate to meet their individual interests and needs” (ibid.). According to Mayer (2006), “[T]he most significant kinds of learning take place when the learner is engaged in experiences that allow him to discover answers, interpretations, ideas, and concepts for himself” (p. 20).

The literature contains many references to the preference of students for family rather than school visits. The reason? “Family visitors value their ability to choose what they attend to and exploit this strategy in order to pursue their personal agenda, and to find out things for themselves” (Griffin 2004, p. S60, with reference to Wood 1996¹¹). Power and Robinson (2005) note that there is much to be learned from family visits when preparing programming for school groups.

The literature and Smithsonian educators both referred to the need to offer middle-school students a combination of structured and free time. They can use the free time to see

¹¹ R. Wood, “Families,” in G. Durbin, ed., *Developing Museum Exhibitions for Lifelong Learning*, London: Museums and Galleries Commission, 1996, pp. 77-81.

things that weren't part of the structured component of the visit—whether other exhibitions and artifacts, or the museum shop.

Learning and having fun. A number of researchers point to the important interrelationship between fun and learning (see, for example, Jensen 1994 and Kelly and Groundwater-Smith 2004). What makes learning fun at a museum? Middle-schoolers want “variety and opportunities for active participation” (Jensen 1994, p. 84), and “new and interesting information and ... ‘hands-on’ various exhibits and artifacts” (Kelly and Groundwater 2004, p. 5). Savage (2000) notes that “exhibitions and programs which are not overtly ‘educational’ may be more successful in attracting this age group” (p. 6). One Smithsonian educator commented on how much “*the students love seeing the real thing. They get excited, for example, when they realize that the gunboat Philadelphia [at the National Museum of American History] is the real thing.*” It appeared to the study team that students on the tour groups it observed spent more time in the galleries with interactives than in the ones that simply offered a viewing experience.

Unfortunately, most Smithsonian exhibitions are not geared to middle-school students. One interviewed educator noted that Smithsonian exhibitions are not inquiry-based and do not consistently offer hands-on activities and interactives; they are still “*curators talking on the wall.*” Another said that the subject matter is not always accessible to middle-school students—“*We are not the most accessible place, and we are a little obtuse...we are really hard to grasp.*” Savage and French (2002) warn that “Exhibitions which are entirely past-focused and do not make direct connections to very recent history and to current society run the risk of being relegated to irrelevance by this age group” (p. 3).

Smithsonian educators and the literature concurred on the importance of hands-on activities. Discovery carts are a common technique for allowing visitors to touch and manipulate objects, and they are appealing to students. However, they are not always available, they can only serve a limited number of students at a time, and they are sometimes geared toward younger children. Moreover, to be effective with middle-

school students, they need to be staffed by people who can facilitate their use rather than just lecture. One Smithsonian educator noted, *“The problem is that the docents consider [discovery carts] a lesser form of interpretation, and for the most part feel that they should be lecturing, the way they were trained by curators.”*

Middle-school students respond well to multi-sensory activities and displays that engage more of the senses than just the eyes. One Smithsonian educator talked of the time when a colleague, worried about the effectiveness of a program, finally relaxed when she got the last delivery—live animals, with their distinctive odors. It made the exhibit real to visitors: *“They had the olfactory system overload ... and I remember thinking that the best programs are so because the physicality and accessibility really take over the senses. In museums we put things in glass cases. To what extent can we use our collections to make it a multi-sensory experience? And for that age group [middle-schoolers] in particular, because you can’t talk to them; so then how else are you going to engage them?”*

The literature and Smithsonian educators are also in agreement that two of the most common activities on school tours lack value and are boring to students: the fact-finding worksheet and the scavenger hunt. One Smithsonian educator observed, *“With scavenger hunts, the team simply divides it up, with some going here and some there, and then they trade answers and fill in the blanks.”* According to Jensen (1994), many students in her study “spoke of these focused museum visits in which they had to fill out worksheets, draw pictures, and take notes to bring back to the classroom, as boring, laborious experiences limited to the agenda of the teacher,” in contrast with “the more open-ended, fun museum visits they experienced with their families” (p. 86). Griffin (2004, p. S66) cites Parsons and Muhs (1994, p. 60¹²) that “while filling in worksheets, group members spoke less to one another, looked at the exhibits less, [and] usually gave up on the worksheets during their tour.” Griffin (2004, p. S62, with reference to Kisiel

¹² C. Parsons and K. Muhs, “Field Trips and Chaperones: A Study of Self-guided School Groups at the Monterey Bay Aquarium,” *Visitor Studies: Theory, Research and Practice* 7(1)(1994): 57-61.

2001¹³) also notes a further problem: too often, the agendas and worksheets prepared by teachers had little connection with the classroom curriculum, which reduces students' opportunities to link their experiences with prior knowledge.

However, researchers and Smithsonian educators commented that well-constructed worksheets and scavenger hunts can be positive activities. One educator talked about how a worksheet could be used effectively in the NMNH Mammals Hall, if the emphasis were less on finding facts: "*Make it so that students can't just copy from each other. Structure the problems so that they have to give examples, take a picture, or draw something.*" Another gave the example of a scavenger hunt at the Smithsonian Folklife Festival, which made clear linkages among the elements that were to be found—"*It's one thing to fill X, Y, Z information for them, but it's a different thing to make those conceptual connections with the scavenger hunt. What is the purpose of finding the 10 items or whatever? How do they all hang together? ... Why did you have to go find these things?*" That scavenger hunt included volunteer interpreters at the points where the objects were to be found; when the hunter found something, he or she went to the volunteer to get his or her passport stamped, and the volunteer used that opportunity to add some content about the item.

Fostering social interaction with peers. The literature also notes the importance of social interaction with peers. A Smithsonian museum educator mentioned that middle-schoolers are very sensitive to what their peers think and tend to travel in packs, and linked this characteristic to opportunities for learning through social interaction: "*The big issue with students is what their peers think. So you have to make the tours social.*" In the museum setting, social interaction can contribute significantly to learning and is cited as an important learning strategy. According to Kelly and Bartlett (2000), "Traditional museum exhibitions do not facilitate dialogue and social interaction, relying for the most part on text panels and display cases to convey the message to visitors. This age group appears to want to share and compare experiences rather than read and view" (p. 1).

¹³ J. Kisiel, "Worksheets, Museums and Teacher Agendas: A Closer Look at a Learning Experience," a paper presented at the National Association for Research in Science Teaching Annual Meeting, St. Louis, MO, March 2001.

Griffin's (2004, p. S62) research indicates that when students are moving about freely, seemingly engaged in personal conversations, they are actually conducting learning-related conversations over 80 percent of the time—linking what they see to prior experiences and discussing similarities and differences between exhibits. In front of exhibits, they point things out to one another or make simple comments. Griffin quotes Birney (1988, p. 313¹⁴) as saying that students ““appear to associate new knowledge with an increase in their social value...they frequently comment that...someone who has seen this material is somehow special and can tell others about it”” (p. S63). Savage (2000) comments on an important role of museums: they “can provide safe public space for simply being together, but, more importantly, they offer content which encourages visitors to share their views with each other and get to know each other better” (p. 6).

Interacting with knowledgeable adults. Although middle-schoolers are at an age where increasingly they want only the company of their peers and want adults to leave them alone, in a museum setting they see interaction with adults as valuable. They appreciate having a knowledgeable adult facilitator who can answer their questions and provide interesting information. This point emerged strongly in the literature and was evident in the three tour groups observed by the study team.

However, there are some ground rules for what constitutes acceptable interaction with adults, two of which emerged as particularly important: the language adults use and the way in which they interact with students. Kelly and Groundwater-Smith (2004) state that adults who interact with students must be “sufficiently learner-focused and prepared to start from the learner’s perceptions and understandings” (p. 8). Sakofs (1984) says that educators need to make students feel that their views and comments are valued. They must listen carefully so the students have a sense of being valued, and they must respond directly to comments. Educators need to solicit observations, provide positive feedback, encourage conversation, and understand that there is meaning in what students say. Rather than conduct lecture tours, which students see as a turn-off, they need to indirectly

¹⁴ B.A. Birney, “Criteria for Successful Museum and Zoo Visits: Children Offer Guidance,” *Curator* 31(4)(1988): 292-316.

draw attention to important aspects of a display or exhibition (for example, by asking questions or giving cues) and slip missed information into the dialogue unobtrusively. In this type of interaction, the adult serves as an explainer—facilitating understanding of the exhibits, and not teaching didactically. This approach requires a lot of training, and some educators have trouble unlearning the lecturing style to which they are accustomed.

Kisiel (2006) notes that the level of engagement during talks by docents varies hugely based on the extent to which the docents involve students, connect to their experiences, share their energy, and address questions that relate to their interests at an appropriate level. Students in the observed tour groups complained that at some museums they visited, educators were patronizing and misjudged the level of the students' knowledge and language skills, for example, defining terms and explaining concepts with which they were already very familiar. One Smithsonian educator similarly commented, "*Students say not to talk down to them. Ask them what they think. 'We may look uninterested, but we are processing what you say.'*" Another educator pointed out the value of having an adult available—"*It makes a big difference that a guide be available because that person provides added context, offers the fine points, shows the small artifacts.*"

The same educator also recommended that "*Tours should be given by someone younger, closer to the students in age. Or have students work with the museum on tours.*" This comment raises a commonly noted problem—museum staff, including volunteers, tend to be older adults who are more interested in dealing with other adults. To address this point, the NPG hires and trains local college students to serve as facilitators with school groups, and has found that it works extremely well. It pays the facilitators \$50 per session, which includes the set-up and break-down (three to three-and-a-half hours of work). On the other hand, the SAAM has been training its docents how to facilitate tours and interact with student visitors since the 1970s, and finds that its docents enjoy working with them.

Smithsonian educators also emphasize the importance of motivated and well-prepared teachers to the success of the visit. As one educator said, "*Obviously on the best tours,*

it's going to come down to the teacher and what the teacher puts into the tour. If the teacher is using the tour along with what she is doing in the classroom, then that is an effective tour." The problem, the educator noted, is that *"we never have control of what teachers do, and we can only do our best to make sure she has pre-visit materials that we produced or post-visit materials."*

The educators stressed that most teachers are not familiar with informal museum learning, and do not know how to use a museum effectively. One said, *"There is a pedagogical disconnect between formal and informal learning environment, didactic versus constructivist. Teachers have to give up control, and that is scary. There needs to be a crossover between their reality and ours."* Another thought museums need to *"help teachers understand the objects and what kind of information the objects can provide."* While museums try to bridge this gap by offering workshops, museum orientation, and other resources, generally they do not have sufficient resources relative to demand.

Some museums, including at the Smithsonian, have tried to create greater access to interpreters (education staff and volunteers) by stationing them at key places in the museum. This approach allows more visitors to come in contact with them than if they simply lead tours. However, this does not typically solve the fundamental problem of too few interpreters relative to demand.

There is little research on the use of chaperones on field trips, and little attention is typically paid to the possibility of a more active role for them. One program that did seek to engage chaperones is the Pathways program at the California Science Center. It provided background information on how chaperones could become knowledgeable facilitators. They found that when chaperones used the Pathways program, it worked well, except in the area of facilitating discussion. Unfortunately, the program was little used. One reason was that teachers needed to do the initial training, and they found this difficult to handle logistically. Perhaps more important, teachers simply did not see the chaperones in the role of facilitators (Burtnyk 2004, p.13). Griffin (2004) cited a study by Parsons and Muhs (1994 [see fn 12]), who found that interaction between chaperones

and students was mostly positive, creating an environment similar to that of a family group (p. S66). The study team observed that some chaperones tried to take an active role in encouraging student learning, but did not do so in the most effective ways. After a while, they gave up.

Feeling physically comfortable. Not unexpectedly, the literature notes that physical discomfort can detract from a student's experience. According to Jensen (2004) and Kelly and Groundwater-Smith (2004), students do not like crowding, cluttered and messy spaces, darkened passageways, difficult-to-read or poorly placed signage, and general inattention to maintenance.

The novelty of the museum setting in itself can also create discomfort. Adequate orientation to the museum can address this. Some museums conduct an orientation when the tour group arrives at the museum or at a specific gallery. Similarly, focusing students' attention on a small number of key points or objects can reduce the sensory and cognitive overload sometimes created by a large, busy museum. (NASM's self-guides are limited to exploration of five objects.)

Post-visit activities. Anderson, Kisiel, and Storksdieck (2006) note that “[P]ost-visit activities strengthen new connections [made in the museums] and give additional context for future experiences” (p. 366). However, the reality is that many teachers ignore this part of the field trip: “Few teachers reported capitalizing on the field-trip experiences when back in the classroom, nor within the curriculum frameworks that were the justification for the field trip” (Anderson and Zhang 2003, p. 8). Educators at the SAAM explained that after their facilitators complete a tour with local school groups, they engage the students in a post-tour activity that uses various techniques to review and reinforce the content of the tour. While not a post-visit activity per se, this does reinforce learning that has taken place in the galleries and provide some closure to the visit.

INDICATORS OF ENGAGEMENT AND LEARNING

As in other areas of education, there has been a movement, at least in principle if not in practice, toward accountability for the outcomes of field trips. However, evaluating the educational outcomes of a museum visit is very difficult. Not only do museums have no formal contact with the majority of middle-school students coming through their spaces, but in any case, fair assessment of the effects of a museum visit requires long-term follow-up with students that is costly and logistically difficult.

Generally, the most that can be expected is an assessment of students' engagement in the learning process while in the museum. Indicators of learning mentioned in the literature (see, for example, Griffin 2002, Bitgood 1994, and Kelly and Groundwater-Smith 2004) include:

- Evidence of students' taking responsibility for and initiating their own learning, such as
 - Knowing what they want to look for
 - Writing/drawing/taking photos by choice
 - Talking among themselves
 - Making choices about their own movement through the museum;
 - Standing and looking/reading
 - Showing curiosity and interest by engaging with an exhibit—such as through absorbed, close, concentrated examination, or persevering with a task such as drawing or working with an interactive
 - Purposefully manipulating objects, “playing” with exhibit elements, or using hands-on exhibits as intended
 - Handling objects with care and interest
 - Drawing connections—for example, by comparing exhibits or making comparisons or references to previous experiences

- Evidence of an interest in sharing learning with peers and experts, such as
 - Talking and pointing
 - Pulling others over to show them something
 - Willingness to be pulled over to see others' interests
 - Talking and listening among group members
 - Asking each other questions
 - Talking to adults/experts

- Evidence of confidence in personal learning abilities, such as
 - Asking questions about displays
 - Explaining to peers
 - Reading to peers
 - Comparing information with another source

- Evidence of responding to new information or ideas

- Evidence of an ability to explain what has been learned to others

- Students' personal declarations—for example, in letters to the museum following a visit

- Affective responses

Assessment of the success of a visit can also address process questions. Process indicators include:

- Time teachers spend preparing for the trip (pre-visit activities);

- Availability of museum offerings likely to engage middle-school students, such as hands-on activities, interactives, and access to a knowledgeable adult experienced in working with this age group

- Appropriate curriculum fit

- Presence of a teacher/chaperone with each group of students to maintain discipline and/or enhance learning

- Use of post-visit activities

THOUGHTS DERIVED FROM A STUDY OF THREE TOUR GROUP VISITS

For logistical reasons, the study team looked at only three tour groups (from a single tour company) visiting NASM in October and November 2006. The first two groups consisted of middle-school students, and the third of high-school students. The study team administered a survey to the students in these groups; spoke with individual students or small groups of students; observed them as they made their way through the museum, and asked them to record their impressions of the visit as it occurred by speaking into small recorders.

In this section, the study team offers some generalizations derived from working with these groups—with the caveat that these should be treated as *preliminary*, because the three tour groups studied cannot be considered a representative sample of such groups at the Smithsonian. That said, the study team did see parallels between the results of its study and the conclusions drawn by the literature.

Timing the visit. Scheduling the Smithsonian stop on the first day or last day of the tour may not be conducive to learning or enjoyment. Students tend to be very tired on the first and last days, and the overwhelming scale of the Smithsonian museums may compound this. On the first day, some students may also be distracted by the novelty factor of being in a new place, particularly those who are visiting a big city for the first time. Less complex landmarks such as the Lincoln Theater or monuments might be better choices for the first day.

Pre-visit orientation. Smithsonian museums are not easy to physically navigate, both because of their size and because wayfinding resources are often inadequate. Similarly, it may be difficult for middle-school students to navigate the museums conceptually—that is, to grasp their underlying messages or themes. One student trying to make sense of his confusion at NASM said:

I like to see like a theme that goes on in the entire museum, because it makes more sense to me. [In an aquarium,] first you're looking at the fish, and then you're looking at shark, and they have a connection. The shark eats the fish. I would like it if you're looking at the Earth and then you see NASA's first mission, and then they have a connection.

Pre-visit orientation DVDs, an easy-to-use (uncluttered) map keyed to museum highlights, and themed self-guides, distributed in advance, might help students navigate the museums.

Duration of the visit. Two hours in content-related museum areas (excluding time spent in the cafeteria) may be too long for middle-school groups. This is particularly true if the visit is unstructured, if the subject matter is not inherently interesting to the visiting group, or if exhibits are not presented in a way that engages individuals in that age group.

Structured and free time. Students on middle-school tours might benefit from a structured component to their museum visit, if it is tailored to individuals of their age. However, this is not to deny the importance of a free-time component, which perhaps could be facilitated by self-guides focused on exploring specific themes or guiding students to museum highlights. For example, one student suggested giving students “...*Half [the] time to look around and half [the] time [for] a scavenger hunt.*”

Links to the curriculum. Structured learning linked to the curriculum might help ground students' visits to museums. When students discover links to something they have learned, they get excited, as with the student who declared animatedly to her classmates upon seeing something familiar in an exhibit, “*Wow. I really did learn something last year.*” Another student said,

It was good because I just thought in a way I haven't ever thought before. ... I've never gotten excited about things like that before. I got this burst of energy

because I was remembering all this stuff from 2-3 years ago. ... Being around stuff that we've learned about kind of set something off in my mind."

Highlighting a satisfying experience, one study team member's conversation with a student developed as follows:

Interviewer: *What did you learn about these things—in school, here?*

Student: *Yeah, about the Kennedy and Sputnik things, we learned that last year in science. We spent months on that, and I am shocked that I remembered it. And it was pretty cool. I'm not really good at science, so that was really like a big thing for me. And just because I studied hard doesn't mean I really took everything in. I guess it shows that I'm good at science. On tests, I study really hard but it doesn't mean I took everything in.*

Interaction with adults. The study team came away with the feeling that having access to knowledgeable adults familiar with inquiry-based learning would have improved the tours. A 12-year-old boy, explaining how such an adult would be useful, noted, *"I think there should be someone for part of the tour— not the whole tour— just to show you where everything is. They could walk around, maybe in the lobby of the museum, and tell you go this way or that way, [and] be available to answer questions."*

Enjoyable activities and experiences. Seeing the "real thing," looking at the exhibits, and engaging in immersive and hands-on activities appeared particularly enjoyable for the tour groups studied. However, exhibitions at the Smithsonian are generally not designed with middle-schoolers in mind, and hands-on activities are scarce and often clustered in one or two galleries. Similarly, immersive experiences like going inside a spacecraft or mine shaft are popular, but in short supply. Stressing the immersion idea, a group of students agreed that they would enjoy

... A plane where people could go in and sit and see what old planes were like. Because we weren't around then. And ... you know how in space they have no

gravity? [Something] like a simulator for that; a spaceship where you could float around. ... A place to go and see the planets and things like that. Were there any places in the museum like that ...? You could watch a movie, but it would be cool to have an interactive that allows you to go in and look at it.

Social interaction. The study team’s findings echoed the literature’s conclusion that middle-school students look forward to and enjoy the time they spend with their friends and peers during a museum visit. Programmatic offerings that foster interaction among students might therefore improve their visit. For example, when queried about whether a greater emphasis on social activities might improve his visit, one 12-year-old student replied, *“That would be good. Not the old type of scavenger hunt, but one where you team up if you want to win, and to win you’d have to learn. That would be very fun.”* Students who were given a scavenger hunt and asked to complete it in teams were also intrigued by the idea of teams competing to win a competition.

Non-programmatic factors. Discussions with the tour group students revealed that non-programmatic factors can have a strong impact on the students’ satisfaction with their visit. Some of these included the following:

- An uncomfortable physical environment. (*“It was really, really hot in the food court; I thought I was going to die. ... When we sat down to eat, it was fine, but ... it was too crowded in line.”*)
- Expensive food. (*“Everything was very expensive there. ... The hamburgers and fries at home are really cheap. Maybe it’s because we’re in a small town, and this is a big city.”*)
- Shopping. The conventional wisdom holds that students on school tours—particularly out-of-town students—enjoy visiting museum shops. However, in the groups studied, relatively few students singled this out in their survey responses as an enjoyable activity.

SOME THOUGHTS FROM TOUR DIRECTORS

The study team spoke with three tour directors and three tour operators.¹⁵ The tour directors offered some thoughts on what the Smithsonian could do to improve visits to its museums, including:

- Providing pre-visit orientation materials (such as maps or a CD with “cool stuff”) to give students an idea of the museum’s purpose and main message(s);
- Offering early or late hours at the museums just for school tours;¹⁶
- Providing materials, such as self-guides to museum highlights, specifically geared to middle-school students);
- Offering more hands-on and fun activities, such as well-designed scavenger hunts;
- Offering docent-led, perhaps theme-based tours tailored to the age of the students;
- Providing easier access to the museums for tour groups—for example, by providing dedicated security lines for such groups;
- Improving the flow in the museums.

Interestingly, Smithsonian museums already have many of the materials (both on the web and in hard copy) that the tour directors suggested, but evidently neither they nor the tour operators were always aware of them.

¹⁵ In this report, *tour directors* refer to tour company representatives who are physically present with the school groups during their visit, while *tour operators* are in charge of scheduling and administering the logistical aspects of the school tours.

¹⁶ SAAM does this for local school groups.

The main challenges the tour directors see for improving the tours relate to the teachers:

- They typically do not prepare adequately for the trip;
- They sometimes push their own agenda (for example, if they have been to NASM before, they may want to go elsewhere this time, even though most students want to see NASM);
- They don't always maintain discipline.

The tour directors mentioned two other issues that can affect the success of a tour:

- Chaperones are usually not interested or motivated.
- Students can occasionally be difficult to motivate.

In response to the study team's queries about what factors contribute to a successful tour, tour directors mentioned the following:

- When the tour directors "click" with the group;
- When all the logistics go smoothly;
- When the students have fun and are excited about what they see;
- When there is teamwork, and everyone "goes with the flow."

WHAT SMITHSONIAN EDUCATORS SAID ABOUT MIDDLE-SCHOOL TOUR GROUPS

In general, the Smithsonian educators to whom the study team spoke seemed to dread the out-of-town tours of middle-school children, whose numbers far exceeded the museums' ability to provide personal contact, particularly during the spring. One common complaint was a lack of supervision of these students, who often were disruptive. Many groups were just dropped off and told where and when to reconvene; no adults accompanied them.

WHAT SMITHSONIAN MUSEUMS OFFER MIDDLE-SCHOOL TOUR GROUPS

Are middle-school tours a priority for Smithsonian educators? When the study team asked them why their museum should invest in serving this audience, all cited one pragmatic reason: they are the biggest museum visitor group from March to June. *“Eighth grade America comes to DC, and that is the biggest chunk of every museum’s visitation of March-June. That is our constituency, and we are here to put in place educational programs for these schools.”*

Some educators also recognized that middle-school tours potentially build future museum visitorship. If these students have a good experience, they may be inclined to return or to visit other museums. Educators at a few museums targeted middle-school students studying American history, which fit these museums' collections: *“Our focus is probably elementary and middle school, because it better fits in their curriculum, and we are also getting more of this audience.”* However, the study team did not hear anyone talk about the rewards of interacting with this age group or the opportunities for transforming attitudes and perspectives.

As noted at the outset, the study team did not do a comprehensive review of how Smithsonian museums are serving middle-school tours. Nevertheless, enough

information about programming came out in the interviews to provide a sense that the museums have some interesting offerings and resources for this age group (or ones that could be modified to engage this age group). However, most museum offerings are not targeted specifically at middle-school students. Similarly, the study team heard of no offerings that specifically address the unique requirements of large commercial tours of middle-school students.

Types of programs that were mentioned include the following:

- **Onsite orientation.** At one museum, staff try to greet every school group (including unannounced ones) at the entrance, and offer a five-minute orientation to the museum. *“So even if they are going just to lunch, they will have a brief, five minute thing before they walk through the doors ... I have a paid staff person and a volunteer at the welcome desk, and depending how crazy it is, they attempt to catch every group coming in and pull them aside for five minutes. And that gives a different atmosphere definitely ... It gives the chaperones some of our expectations (you are expected to stay with your group, to facilitate their visit here, be alert to the way to visit.)... It’s an orientation to both the museum and experience.”* Most museums do not use this approach. An educator at one museum said that in the past, a security guard met every bus, but it had to discontinue that initiative.

- **Self-orientation and self-guide materials.** Given the extreme shortage of staff, paid and volunteer, most Smithsonian museums have to rely on self-orientation and guide materials. *“Our role is to give them those materials, and let them know that they are available.”* These materials generally are available online and on-site, and museums will mail them to teachers when requested. The educators’ experience has been, however, that the teachers often do not use the materials or make them available to the students and chaperones. OP&A’s observation at one museum is that the materials are not well-publicized, and there is no proactive effort to get them to visitors. Rather, someone has to know to ask for them. Even

then, not all staff are aware what materials are available. Finally, the materials are not geared specifically to middle-school students and may or may not be suitable.

The self-guides that the study team saw tend to direct visitors to a just a select number of objects, between 5 and 12—“*Look at 12 things, but that is it. And I think that is appropriate ... to this age group. And you have to let go, to allow yourself to do just this one concept [in the guide], but hit them over the head with it in a fun and creative way.*” The self-guides are structured to “*encourage students to look at the artifacts, and they ask specific questions that are easy to find the answers to.*” NASM educators believe that their three themed guides, while for a range of ages, are still appropriate for middle-school tour groups. NASM’s approach was to limit the number of objects to be seen to around five and to keep the text short, focusing mainly on the questions for visitors to consider and not on a lot of facts, although a few facts are presented for each object. The guides are intended to teach students how to look at something and to compare objects, and not so much on learning facts. Following the self-guide may occupy 45 minutes or so, which the educators believe is an adequate time for a structured activity. NASM used focus groups of teachers and students and formative evaluations extensively in putting the self-guides together.

- **Tours.** The museums offer at least one general tour per day, and some offer an additional tour(s) specifically for school students, although these are mainly available when requested in advance. The educators acknowledge that they could never meet the demand for school group-specific tours. It appears that most tours are led by volunteer docents, who tend to employ a didactic style of presentation, except at NPG and SAAM.

- **Supervised, staffed hands-on activities such as discovery carts.** Most museums make use of discovery carts, and they are very popular with students, who, as noted, appreciate hands-on activities. Again, these carts are generally

available to any student group. The drawback is that there are too few staff and carts to be available throughout the day, and they can serve only a small number of students at a time, perhaps 5-10.

- **Activity rooms.** These rooms are available to middle-school groups along with any other audience, but they tend to be geared to a younger audience.

- **Performances/films/videos.** Most museums offer live performances and sponsor special events from time to time. These types of activities can be very appealing to middle-schoolers. However, they often occur on weekends, whereas tours generally come on weekdays. Logistically, it is hard for the tour operators to arrange to be at the museum at the exact time a performance is available. Similarly, special films are shown mainly on weekends or evenings, posing the same logistical problems. The big Smithsonian museums all have IMAX movies. In the case of the three tours that the OP&A study team observed, no students viewed the movie. Some wanted to, but hadn't realized that reservations were required and what the cost was, and often the visit was too short to permit both seeing the displays and going to the IMAX. From the museum educators' perspective, "*the museum is not about IMAX.*" They prefer the students to explore the galleries.

Educators expressed their willingness to do more to engage middle-school students. At one museum, for example, an educator spoke of current collaboration with the exhibition office to make a new exhibition more appropriate for students, for example, through special, color-coded text and more interactivity. The exhibition team has included educators from the beginning. Other educators talked about the need to train staff, including volunteers, in using a facilitated, interactive approach on their tours—"*to get them more active and less passive, and more inquiry-based and more engaging as far as what you're reading, and that is for every age group.*"

WHAT SMITHSONIAN EDUCATORS WOULD LIKE FROM TOUR OPERATORS

When asked what they would like from tour operators with respect to enhancing visits by tour groups of middle-school students, Smithsonian educators had the following to say:

- **Provide resources (financial, etc.).** The consensus was that the museums do not have more resources to invest in serving this audience, which for some is not a priority except for their numbers. At the same time, they believe they have materials and programs that tour operators can build on if they want to, and the educators are willing to work with them. One educator said, for example, *“We do have a satellite broadcast which targets definitely school age groups, and that makes a lot of sense for [a tour operator] to support our efforts to market that ... That kind of resource package with a podcast, other things ... [like] self-guides.”* Another educator said that tour operators *“could provide funding for the services that can really best address the needs of their audience. If you’re talking about doing what is right for middle school, we identified a couple of different venues for that, immersion programs, experiences with dance and other artistic traditions, different native communities. Those things will take resources we don’t have ... [the tour operators could] provide funds so we can research, identify, and provide films that would be appropriate for the middle-school audience.”*

- **Enhance tour operators’ and directors’ knowledge of Smithsonian museums and its resources.** Educators believed that tour operators needed to be more aware of:
 - The museums’ administrative requirements and constraints
 - What they have to offer in terms of programs, activities, and materials about visiting the museum
 - The best times to visit, although the educators recognize that the timing of the visit is somewhat out of tour operators’ hands. Tour operators

might, however, want to do more to take advantage of times when it is optimal to visit the museum. They could market different alternatives at the Smithsonian to schools. Perhaps they could also work with the teachers to improve the pre-visit preparation for the visit, such as orientation to the museums—*“Tell them [the students] what they are going to see, get them excited about it.”* Another suggestion was a video or DVD to show on the bus.

Smithsonian educators are very sensitive about two things with respect to commercial tours. They are concerned that tour operators not engage in programming that might lessen the Smithsonian’s reputation for integrity and authority. To that end, they want to be involved in whatever is developed by tour operators. One said, *“I get paranoid and defensive about having an outside agency having control over the interpretation of our museum’s collections.”* The second point is that the museums cannot appear to be favoring one audience or tour company over another; whatever they do for one, they must do for all. In listening to Smithsonian educators, the OP&A study team found some uncertainty about what were appropriate and inappropriate collaborations with tour operators.

APPENDIX A.
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APPENDIX B. SELECTED MUSEUM YOUTH PROGRAMS

Focus on Youth Program, Queen Victoria Museum and Art Gallery (Savage and French 2002, pp. 4-9)

In developing this youth program, part of a larger effort to engage younger audiences, the Queen Victoria Museum and Art Gallery established the position of Museum Youth Audience Officer; formed a Museum Youth Advisory Group; provided professional development for museum staff in audience research; developed a Focus Gallery that provides different access to contemporary and colonial art collections by both youth and general museum audiences; developed the website to be an attractive means of access by youth to the collections; and developed a Youth Studio.

School Programs, Japanese American National Museum (Sasaki 2005)

At the core of the educational philosophy of the Japanese American National Museum is that students make “personal connection between past [the Japanese internment in World War II] and present ... More than learning just the facts and figures ... students should connect events in their own lives with the lives of Japanese Americans.” When the museum decided to improve its offerings for school tours in an effort to keep up with their burgeoning numbers, it came up against the typical, harsh realities of museum life: it could not immediately change exhibitions whose design was not engaging to youth audiences; reduce the size of the school groups; eliminate the glut of groups visiting in the spring; or change the configuration of its space into multiple small galleries. It opted to use its education programs as the vehicle for near-term change. To better engage youth audiences, it increased the availability of hands-on activities and interactive performances outside the galleries and allowed teachers to choose among activities. To help students make personal connections, it used art educators as facilitators to provide

initial information, foster dialogue among the students, and guide them toward certain things. The museum developed a structured mural-making activity in the gallery housing the key permanent exhibition, *Common Ground: The Heart of Community*. “Mural-making [served as] a platform to discuss not only the unconstitutional incarceration of Japanese Americans ... but also other issues like civil rights, democracy, community history.” The museum trained teachers in museum facilitation and encouraged pre-visit and post-visit classroom activities. To further museum-educator collaboration, it set up educator advisory groups to consult on the design of educational projects and program presentations, and incorporated their feedback. Teachers also evaluated the programs/projects. The museum educators worked hard—and successfully—to sell museum staff on the new approach. An evaluation with students 2-3 months after their museum visit revealed that they liked the freedom to choose what interested them and how to depict that interest, which helped them construct personal meaning, understand concept of self-expression through art, and connect to history.

**Improving School Visits to the Permanent Collection,
High Museum of Art
(Adams and Sibille 2005)**

The High Museum of Art wanted a new and better strategy for school visits to see its permanent collection. In partnership with the local school district, the museum developed the “I See Literacy” tour. The goal of the program is that “their [the students] museum experience will not be that they visited a sacred temple and heard a high priest talk about art being good for them. Rather, their museum experience will be to a cool place where, with the help of an adult, they build up their ability and confidence to explore art on their own.” Consistent with the interests of the school district, it established a link to school curricula that went beyond art—“For an art museum ... it [is] critical to express field trips as integrated learning experiences beyond the subject of art. ... [the museum] must demonstrate strong links to language arts, social studies, or other non-arts disciplines.” To enhance literacy, including visual literacy, the program integrated visual arts learning around objects on display in the permanent collection and used guided student tours; professional learning for teachers; classroom resources that

linked the tour and the classroom; and hiring of a teaching artist-in-residence to provide a creative art-making classroom experience. “Students would make inferences, support ideas with details, compare and contrast works of art, and consider the writer’s or artist’s purpose, cause and effect, and sequencing.” The tour assists students to construct meaning from works of art and demonstrates the parallels between reading works of text and works of visual art. Facilitators ask students to articulate responses and to find evidence to support what they say. Initially the docents were very opposed to “I See Literacy,” rejecting the skills-based, divergent facilitation style of presentation as being ‘not about art.’” The museum converted some train new staff, many of were university art students. When the museum found a disconnect between what teachers said they wanted and what they actually used, it decided to invest in offsite visits by museum educators to classrooms.

**Involving Chaperones
at the Chicago Architecture Foundation
(Linsner 2005)**

In an effort to extend access to its scarce staff and augment their numbers, the Chicago Architecture Foundation (CAF) tried several approaches. It found that “A single docent can effectively deliver content to a busload of 60 students and chaperones [while on the bus].” It has engaged chaperones to deliver content and keep students on-task during tours. Teachers do the initial chaperone training at their schools, and CAF then builds on it the day of the visit. CAF encourages schools to come on off-peak days and times. It requires that all volunteer program deliverers learn to deliver the youth program as a condition of becoming a docent. CAF is developing a new volunteer position exclusively to support youth programs.

**A Student-Centered Approach to a Sciencentre Visit,
St. Stephen's College and the Sciencentre**
(Lucas 2000)

In preparing for a visit to the Sciencentre, a teacher at St. Stephen's College established as goals that student learning be fun and student-centered and provide opportunities for learners to share their information/knowledge with one another. Prior to the visit, she conducted a pre-visit lesson on different ways of learning, including the effectiveness of teaching others, and undertook other pre-visit activities. By the time of the visit, the students "knew that they were expected to learn, they were equipped with a range of learning strategies, and they anticipated that learning would be fun." The visit began with excellent demonstrations that left students in awe. Each small group, accompanied by a parent, then had 90 minutes to spend in the galleries. They stayed longest where they could engage in significant physical involvement. The teacher encouraged the students to focus on the labels to help in understanding aspects of exhibits, had them relate the exhibits to a real-life application, and to explain the purpose of the exhibit to her or other students. The teacher suggested that the Sciencentre: color-code the labels based on readers' levels of sophistication.

**High-School Student Volunteer Docents,
Museum of Fine Arts, Houston**
(Choi 2006)

The Museum of Fine Arts, Houston, began a student volunteer docent program with a local high school in 1991. The theory was that "As a barometer of social issues and interests, high school students would help us spark the imaginations of a young audience of museum-goers." After two months of training, the students, who commit for one school year, are assigned to lead after-school tours for students. The program integrates teaching about collections with development of tour techniques. "The students design their tours, select the works they will explore with their groups, develop transitions from one work to another, and create engaging themes for the younger children." According to the museum, "The[se] docents' unique and fresh perspectives help break the ice with the

students, who are clearly excited that their docents not only know a lot about art and are comfortable in the museum, but are also the ages of their older siblings.” The volunteer students also do daily tours for walk-ins during the holidays; assist at Family Days; guide teachers with art activities; and help at Evenings for Educators and with event preparations generally. “They bring in new audiences, and their enthusiasm and appreciation inspires the staff.” One high school docent, commenting well after graduation from high school, said, “The docent program will remain a part of me forever. It erased my belief that museums are only for a certain class of people, and [I] saw that I could penetrate the grand and intimidating façade of a museum....In all honesty, my experience as a docent was the most significant activity I participated in during high school.” Each year 30 students in the high school art program join the program.

**Collaboration with Teachers,
Cincinnati Museum Center
(DeDominici 2004)**

The Cincinnati Museum Center established a Teacher’s Advisory Board that meets every two months to discuss what is happening at the center and how it might affect teachers. The board advises the center on what it thinks does and doesn’t work. For example, the center has learned that what it names its programs can attract teachers or not. The center also sponsors “Teacher for Teacher,” a series of workshops in which teachers showcase what they have done that works. Just before an exhibition opens, the center holds a “Just for Teachers Night” where teachers can tour the exhibition and get information that they can use with their classes.

**Meeting the Space Needs of Students,
Children’s Museum of Indianapolis
(Power and Robinson 2005)**

The Children’s Museum of Indianapolis develops its exhibits with schools specifically in mind. The museum has a school services staff, who are part of exhibition development

team from the very beginning. Their role is to understand the physical space constraints, share information on content, and plan educational products. The museum decided on placing learning stations with hands-on activities in a space behind each exhibition scene and to designate separate gallery spaces for certain activities, such as discussions. This spatial arrangement is based on how school groups use the museum—typically the teachers break the students into smaller groups of 3-5, each with a chaperone. The museum also developed a sound and light show with a special zoned audio narration station for each exhibit scene. The interpreters have access to a wireless microphone system, also built into the exhibit areas.