Evaluation of the "Science in the Stacks":
A Museum-Library Collaboration
to Create Traveling Science Exhibits for Libraries

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Submitted to the Montshire Museum by:
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<u>Introduction and Project Description</u>: The *Science in the Stacks* (SITS) is a project
funded by the Institute for Museum and Library Services (IMLS), as one of their national
leadership grants (Grant #LL-90100-99). It is a collaboration between the Montshire
Museum of Science in Norwich, Vermont, and eight small community libraries in New
Hampshire and Vermont Together, they have created eight traveling science exhibits
coupled with programming packages that have traveled through each of the participating
libraries and communities.

Each of the traveling science exhibits focuses on a specific theme, derived from a set of
topics proposed by each library. (See Appendices A and B for description of exhibits and
list of participating libraries.) Each exhibit is composed of various objects and interactive
devices encouraging hands-on inquiry and experimentation appropriate to the theme, and
is designed to engage learners of different ages to facilitate family learning. Reflected
the limited space of rural libraries, each exhibit is designed to fit on a tabletop, be of low
maintenance, and be easily transported in a commonly available mini-van. Part of each
exhibit display is a bookshelf of recommended fiction and non-fiction books relating to
the featured theme.

Each exhibit also has a set of companion activities suitable for a library setting, designed
for a range of different age groups. These include activities geared for the whole family,
to be used as special family/children programming held on weekends, after-school, or
school vacations and hands-on activities for preschool children that are done as part of a
regular story hour. Selected exhibits also had activity bags of materials for school
children to use in the library or borrow to take home, as well as take-home brochures,
featuring follow-up activities that families can do at home or in their community, and a
list of recommended books, videos, and other media related to the exhibit's theme.

At the heart of the project was an attempt to establish a true collaborative relationship
between the museum and the libraries. Rather than having the museum serve as the sole
designer of the exhibits and have libraries simply host and implement the exhibit-
programs, each library was asked to actively collaborate with museum staff to design one
of the eight exhibits. One library staff member -- typically the children's librarian--
worked closely with a museum staff in Spring and Summer 2000 to brainstorm topics,
materials and educational foci of the prototypes and final exhibits. Library staff took the
lead in coming up with a proposed list of books, videos and CD's to form the core
collection that would travel with the exhibit, while museum education staff assumed
primary responsibility in coming up with science-oriented activities and programs for the
exhibits. A major project meeting took place in November 2000 when each library
shared its exhibit, collections and activities to the other seven.

Exhibits began to be available to the public in December 2000. Each library had an exhibit for roughly a six-week period, after which time the exhibit rotated to another library and another exhibit came to take its place. Thus, the exhibits rotated through all eight participating libraries, with the showing of the final exhibit ending in December 2001, almost a year after the initial exhibit premiered. The library's original exhibit then returned, where it can remain as the property for the library to continue to use permanently if is so chooses.

To foster a process of collaboration between the Museum and the participating libraries, the project was structured so as to have two co-directors: the museum director and the director of the largest library of the eight SITS libraries. There was then a series of events and meetings over a 17-month period, including:

> • an introductory orientation meeting of all participants to introduce participants, discuss overall project strategy, respond to participant questions, and to establish working relationships and communication strategies (November 1999)
> • an IMLS meeting in Washington on evaluation attended by a cross-institutional project team (1 museum staff, 2 librarians, and evaluator) (December 1999)
> • a kick-off symposium with Dr. David Carr, guest lecturer/expert on library-museum collaboration (February 2000);
> • site visits by the museum designer to all SITS libraries to learn about library size and space, layout and traffic flow
> • a full day planning workshop at the Montshire Museum for librarians to learn about science exhibit design, and project evaluation (March 2000)
> • an afternoon session at the Howe Library for librarians to share information on family and children programs at their libraries and approaches to book collections (April 2000)
> • meetings and communication between the museum designer and lead librarian, to design exhibit prototypes (Summer 2000)
> • second all day workshop in which completed exhibits, collections and program materials were shared (November 2000)
> • mid-way project meeting for librarians to share with museum staff and each other the ways the exhibit-programs have been implemented and received in their communities (July 2001)

A project website was also established along with a project e-mail listserv to support communication among project participants.

Evaluation Component: As with many funding agencies, IMLS is requesting that evaluation be a critical component of its projects. The IMLS is now encouraging all funded projects to incorporate an outcomes-based evaluation in its program design. This approach suggests that institutions focus on measuring the effects of an institution's work on its public (outcomes) rather than on the service provided (outputs).

There were two major foci for the SITS evaluation. The first centered on the desired impact on intended audiences: *"Did the exhibits and programs have the desired impact*

on libraries and their audience?" The second examined the pioneering effort of collaboration between libraries and museums at the heart of the project*: "What did we learn about how to structure a process fostering genuine collaboration between the museum and library professions?"*

To address both questions, the project evaluator felt it was important to devote some of the evaluation effort to look closely at the nature of the eight participating libraries and their communities. In order to understand whether or not a program is serving the needs of its community and its institutional stakeholders, it is important to seek an understanding of those institutions and those communities. Furthermore, we recognized that being a rural library in Vermont or New Hampshire did not fit a singular profile, and that it was important, as evaluators, to recognize the inherent and rich diversity in capabilities and conditions that existed across the libraries and communities in order to assess the impact of a program on its host institution and its community.

There were three major phases of data collection for the evaluation. Phase I occurred during the initial phases of the project (measures: attending early meetings; initial librarian survey; demographic research). Phase II occurred once the SITS rotations had begun and continued throughout the duration of the exhibit-program implementation (measures: circulation of core and supplemental book collections; librarian observations and summaries; program write-ups; collection of program materials and flyers.) Phase III of the evaluation was after the completion of the final exhibit, and asked participating librarians and museum staff to reflect back upon the project and exhibit design and implementation (measures: final surveys to librarians and museum staff.) The project evaluator also attended all formal events and meetings of the partnering institutions, several meetings between the museum designer and librarians during the prototyping phase of the exhibits, and participated as a core member of the project team during various project-planning meetings throughout the course of the project.

Findings from Phase I: Demographic Research and Initial Librarian Survey

      Demographic Research on SITS Communities: Examination of key town and library documents (Valley News Supplement, 1998; and Vermont and New Hampshire Library Reports, 1998) revealed considerable differences between the local communities of the eight participating libraries in population numbers, numbers of school age children, and household income. SITS communities ranged in size from 13,850 (Claremont, NH) to 1,537 (Lyme, NH); comparable contrasts exist in the number of elementary school-aged children (1,017 children in Claremont vs. Lyme's 201 students.)

Significant economic disparities exist in household income (including dual career families), ranging from Claremont and Newport's figures of $30,000 and $32,000, to Hanover's $65,500.

Education levels are provided for Vermont towns in state reports we obtained, but not for New Hampshire towns. Population differences in educational level exist between the

project's two Vermont communities, with 63% of Norwich residents having a bachelor's degree or greater, compared with 41% of Thetford residents.

Figures concerning the number of community residents who are Montshire Museum members (Montshire Museum database) during the 1999-2000 year offer some index of the level of penetration in these communities, ranging from 829 in Hanover to 20 in Newport.

Examination of state library reports reveal a considerable range in the amount of financial resources and services offered in the different SITS libraries. One library has an operating budget of only $37,000 while another has one of over $200,000. Accordingly, there are differences in staffing levels (e.g., less than one FTE paid librarian vs. 13 paid staff members) and hours opened (27 hours per week vs. 51 hours per week).

Considerable differences also exist in the amount of programming offered to children (ranging from three libraries offering between 60 and 80 programs per year vs. three libraries offering over 300 programs in a year), and in the number of child attendees per year (550 children vs. close to 11,000 children).

Patron use of the library appears highly correlated with the economic earning power of its households, presumably reflecting the educational level of its residents. The highest circulation per capita (34 items) is in one of the towns with the most affluent SITS households, while the lowest (averaging 8 items) are in the least affluent towns. Similarly, the highest number of adult programs and resulting number of adult attendees are in two of the most affluent towns.

Initial Librarian Survey: Of the ten librarians responding to the initial survey, all but three are highly experienced librarians, having ten years or more of professional experience in libraries. All but two are full-time staff. A little over half (6 out of 10) are relatively new staff members to their library, with three years or fewer in their current library. Most serve as the children's librarian in their library, while a few are library directors in the smaller libraries with only one or two paid staff.

Librarians described a considerable variety and amount of children's programming in their libraries. Several of the larger libraries have a very high level of activity, with several programs offered most days year around. In contrast, one of the smaller libraries offers only one or two weekly story-times for preschoolers and toddlers. Adult participation (parent or daycare provider) is mainly required for story times for young children. Special events (e.g., visiting storytellers, performers, or speakers) are the events most likely to invite families to attend as a group. Relatively few activities target middle school and high school age children, with only occasional art/poetry contests, class visits, book talks, and "teen read week".

The SITS libraries also represent a range of relationships a library might have with its local school. One library serves as the school's library and regularly has school visits of classes of students. Thus, it gets regular heavy use by school age children without their

parents, simply through school. Another library heavily supplements what is offered through school; it does class visits, has daycares and preschools visiting for story hour, serves home schooling families, and is used extensively by local teachers in and outside of the district to supplement classroom resources. A third town has an active school library that remains open during the summer, and results in families being less reliant upon the public library for their children's reading needs.

Librarians also described the highly temporal and seasonal flow to their patrons' use. During the school year, parents with young children attend story hours in the morning and early afternoons, while older elementary school children and middle school children often come to the library after school, as a place to do homework, talk with friends, and wait to get picked up by parents. Two libraries serve as lively community centers for children and have active after-school programs.   School vacations and summers were especially busy times for the libraries, with many offering a series of special events and reading programs to school age children.

Given that the librarians were critical stakeholders in the SITS endeavor, it was important to seek their perspectives on their goals and concerns. What were they most excited about? What were they most concerned about? Librarians' responses indicated that they shared many of the central goals of the project, concerning <u>changing the nature of libraries</u> ("expanding the role the library plays in the community – making it more experience-oriented rather than a place to pick up what you need and go"; "encourage all library patrons, of all ages, to come and see the library as a center for learning, as well as place to get reading materials"); <u>encouraging family interactions</u> ("offering something new to families that will bring them into the library and give them something to talk about", and <u>fostering learning</u> ("help promote learning on a variety of levels, providing an area where our patrons can interact and open their minds for inquiry and investigation"). Several librarians voiced their interest in collaborating with the museum as well as with the other libraries.

The concerns that librarians expressed centered upon the time commitments and expectations given their already full work schedules and responsibilities, lack of staffing, and concerns about whether an exhibit could fit a library's tight space requirements and was sufficiently durable to withstand heavily handling by children. One librarian expressed her concern with her relative lack of knowledge about scientific concepts and vocabulary.

<u>Findings from Phases II and III: On-going Assessment during Program Implementation and Final Assessment of Exhibits and Programs</u>

<u>General Description of Program Implementation</u>: During the 13 months that the SITS exhibits rotated through the various libraries (Phase II), all the librarians were asked to fill out a number of evaluation forms, concerning observations of patrons' use of the exhibit, descriptions of SITS program events, and circulation patterns of SITS books. Seven of the eight SITS libraries submitted these on-going evaluation forms.

Results of the evaluation and discussions with librarians indicate that the implementation of the SITS exhibits and programs proceeded quite smoothly, with regular delivery of SITS exhibits to new library locations, and a minimum of technical difficulty and problems with exhibit durability. Library patrons of all ages – particularly children and their parents – interacted with the various exhibits with great interest and enjoyment, and engaged in a variety of after-school and special programs, while exercising relatively modest levels of borrowing of core literature accompanying the exhibits.

Evaluation Foci #1: Impact on Library Patrons: In discussions with the two project co-directors, it was decided that the evaluation's primary objective was to examine the collective impact of the eight exhibits on the community of library patrons, rather than a more exhibit-specific examination of the learning outcomes and impact of each exhibit on individual children and families. Thus, analysis and resulting findings presented below are organized by librarians' assessments of the overall collection of SITS exhibits, programs and book collections.

SITS exhibits engaged patrons' interest, invited social interactions around learning, and invited open-ended science exploration.   To define success indicators of positive impact, we modified a number of exhibit design criteria regularly used the Museum staff. Librarians rated the set of eight exhibits along three dimensions as to whether the set of exhibits: featured topics' interest to people of many ages and backgrounds; invited interactions among family members, and children; and invited open-ended science exploration by visitors. Librarians rating these dimensions along a five point scale (1 – not at all; 2 = a little; 3 = Some; 4 = A good amount; 5 = Very Much), as well as could indicate that they were "not sure."

As shown in Figure, librarians rated the exhibits quite highly along the dimensions of interest of topic, encouragement of social interactions, and open-ended science exploration.

Figure 1: Librarians' assessment of exhibits' topics and elicitation of social interaction and scientific exploration

Program Qualities and Desired Impact	Librarians' Ratings (average/mean; range)
The exhibits' topics were interesting to people of many ages and backgrounds (n = 13)	4.08 (range: 3-5)
The exhibits invited interactions among family members, peers, and older/younger children. (n = 13)	3.75 (range: 3-5)
The exhibits invited open-ended science exploration by visitors. (n = 13)	3.71 (range: 3-5)

(Rating scale: 1 = Not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

Illustrating the impact of a SITS exhibit on community members is one children's librarian chronicling the use of the Tools exhibit over her six-week rotation:

2/5: Plumb Level Square has arrived. The morning is quiet. Those in, barely look at the exhibit... By afternoon, after-school school-age children are gathered about investigating and discussing.

2/8: 2 moms with pre-school children on stools investigating plumb bob, levels, and circle level. Curiosity. Why bubble always comes back to same place? Levels, rulers, pencils activity sheet – we're being measured and "leveled" throughout children's room.

2/11 Since 2/10 "Open House" several have appeared to investigate exhibit. A plastic hard hat and simple play tools have been added. Young children are "fixing" things while parents and older children use exhibit.

2/15 Several K-1 age boys looking at tools and books. Mom is explaining what levels and plumb-bobs do. The car and incline is taken to table. Used for about 30 minutes.

2/20: Very busy after school – many older students at exhibit. Serious talk about exhibit parts. Looking over handouts and using levels – no writing.

2/22 Some activity – not as busy as the previous two days. Much activity by adults and children of all ages.

2/26 First day of vacation. Activities out all week. Very busy and very popular.

3/1 Some 86+ people were in and out of children's room this day. Some stayed for a period of time using activities and exploring the exhibit. Other programs have been going on this week as well – very popular exhibit, activities and books. Everyone had a good time/ very high interest.

3/8. Some 468 people (total) were in and out of the children's room during vacation week. Very active and many repeaters to come back to use exhibit and activities (children and adults.)

3/17: There is still interest in exhibit and books, but not as high as it was earlier. The flow of people is slower, but steady. Some people are newcomers. But there are repeaters who are happy to share their knowledge and look at the books. We are still measured and checked for being level.

SITS exhibits that were most successful were ones that had topics that were inherently interest and relatively familiar to patrons, not too abstract, and encouraged hands-on activity in creative, open-ended ways. In the final survey, librarians were asked to identify which exhibits they felt were most successful and least successful, and to indicate reasons for their choices, based on what they observed with their library patrons. The Structures exhibit was identified as the most successful by five librarians, who indicated that it was inherently engaging, easily apparent to visitors what to do and related to something that they already had experienced (building with blocks and toy construction materials), and involved active hands-on experiences that were open-ended and encouraged creativity and imagination. It also was observed to be equally successful whether pursued as a quiet, individual activity, or as a lively group project. While it could be completed in a relatively short time, it was also observed to sustain attention. One librarian noted that a girl used the structures exhibit for over an hour, and that children would come repeated across multiple days to work with the materials. As three of the librarians who selected Structures as the most successful noted:

> *This exhibit elicited the greatest amount of interactive interest. Children ages 2-14 and some parents spent good amounts of time building with the materials. Both sexes of younger children were involved and boys of middle school age were*

big users. Many children used the exhibit each time they came. Parents were happy to have younger children busy while they were checking out books and the exhibit kept some restless boys busy after school. Many parents asked where we got the materials so they could purchase them...It was straightforward and easy to interact with – probably the best hands-on one. Older children incorporated triangles in their structures and probably looked at the information provided, while younger ones felt right at home with building materials.

[Structures] was probably the most successful in terms of patron numbers, vocal enthusiasm and interaction at the exhibit itself on main floor and at a preschool story time for parents and children...The exhibit design, i.e., the opportunity for people of all ages to handle and build structures, was appealing. Its tactile and kinesthetic qualities and opportunity to produce a fairly quick, but unique product was satisfying to people. This was extended in our preschool program, by a children's room staff member, so that children had a chance to build, focusing somewhat on triangle shapes, with a variety of materials.

Shapes provided the most creative and interactive exhibit. Children of all ages were willing to work on constructions alone and together, on occasion for thirty minutes or more.

Plumb Level Square, the exhibit featuring tools, was chosen by two librarians as the most successful and seemed to actively engage visitors across all the libraries. Observations across the libraries indicated that the focus on tools was inherently approaching, active, and especially appealing to boys and fathers, while still being engaging to girls and mothers.

All visitors were very interested in this exhibit. I feel that their interest and level of confidence for using the parts of the exhibit and participating in the activities hinged on the fact that the topic was a very familiar and concrete one for these people. The level, ruler, plumb bob as well as other simple tools are things that most have a daily/weekly contact with. Many in the area are carpenters of one sort or another and use hammers, etc. to work or handle repairs of many kinds. This confidence enabled adults to explain the exhibit to children without appearing to be "stupid". It empowered them because of its familiarity. No one had to ask, "What does it do?"

We did a lot of programs with this exhibit, including the school. This exhibit tied in with Newport's history and with this the children learned about Newport being called "The Machine Tool Town." With this exhibit we were able to incorporate local craftsman to come to the library. Also, we had after-school activities that related to the exhibit. The fact that we could tie in the local history of the town with patrons really held their interest. With this exhibit, the kids could make a plumb, level, and square to bring home [which] was a favorite. The design of the exhibit, the part with the pillars, made it blend in nicely with the library's décor.

In another library, the Tools exhibit was accompanied by a special program featuring five local exhibitors of old tools, along with a "mystery game" of finding various tools that grates, grinds, sharpens, pinches, pulls, etc. The librarian wisely scheduled the event on local Boy Scout meeting night (to guarantee an audience of at least 12 boys), who were joined by the surprise arrival of 50 visiting elderhostelers. All thoroughly enjoyed the event.

The Birds exhibit was by two librarians as most successful. Reasons offered were similar to those offered by the other librarians, including children's and adults' interest in animals in nature, its straightforward presentation, high quality video, and good link with visiting speaker programs with the Audubon society.

> *Kids liked to feel the wing and then felt very connected to exhibit. The exhibit didn't require explanation and supervision (except for the volume control). It appealed to all ages and wasn't intimidating. Parents didn't feel they would be asked questions they couldn't answer. It was immediately obvious what to do. It was soothing, attractive to young and old, appealed to the sense of touch, sound and eye. Excellent video. People relate to nature.*

Interestingly, librarians rarely indicated that the exhibit which they themselves designed was the most successful. It is likely that this was somewhat due to the fact that their exhibit was the first in the series, and that it took time to build patron expectation and awareness of exhibits in the library. As further evidence for this reasoning, five of the eight lead librarians picked exhibits that came as one of the last three exhibits of the project (i.e., fell as the sixth, seventh or eighth exhibit in the sequence of eight exhibits). The only one librarian who picked their own exhibit as the most successful was one that picked a topic that was special to their town.

When asked which exhibit they felt was least successful, lead librarians (the librarian at each library primarily responsible for overseeing the SITS exhibit-programs) indicate four different exhibits: Resonance (3); Dividing Time (2), Colors (2), and Birds (3). Three of the four exhibits -- Resonance, Dividing Time, and Color Filters – dealt with the most abstract scientific concepts. While children and families were seen to interact with the exhibits and experience the underlying science phenomena, interaction with the exhibit was comparatively short, compared to other SITS exhibits, and patrons appeared difficult to grasp the underlying scientific concepts. Similarly, the librarians found it difficult to support their learning, and even the museum educators, during the design phase of the exhibits, acknowledged that the value in the exhibit was experiencing, but not necessarily understanding or being able to explain, the scientific phenomenon at hand.

For example, regarding the Filters exhibit, there was a common confusion between color pigments and colors of light. As expressed by one librarian, " It was too abstract. One dad said that he thought it must be 'broke" because yellow and blue did not make green! [People felt] like something wasn't working right because it didn't produce the expected results."

The Birds exhibit was picked as the least successful by three librarians, who largely cited the non-interactive and relatively limited hands-on nature of the exhibit, given its more presentational and "informational" approach. On the other hand, as noted earlier, others had chosen Birds as the most successful, given the inherent appeal of animals, and patrons' familiarity and interest in the topic of birds.

SITS programming offered by the libraries actively engaged children, families and adults in the community. Librarians offered a range of different activities and programs in their communities. A number of librarians regularly incorporated SITS-related activities into their normal children's programming. Almost all of the libraries featured SITS-related books in their weekly preschool story times, and followed stories with science-related activities and projects. For example, one librarian read stories about noise, had children snore into tissue paper, and then make phones out of paper cups as part of the Resonance exhibit. Another library that offered regular movie screenings for children after school, featured videos on simple machines (showing how items like ice cream and softballs are made) in conjunction with the Tools exhibit. The several libraries that had active after-school programs for children engaged students in soap stone carving activities along with the Tools exhibit, or had children work at different activity stations building structures out of blocks, Lincoln logs and Tinker toys as part of the Structures exhibit.

Most libraries invited guest speakers and presenters, such as local cabinetmakers for the Tools exhibit, staff from the Audubon Society for the Birds exhibit, and regional musicians for the Rhythms exhibit. One library even invited a pair of jugglers from a local high school as part of their Reaction Time exhibit These special programs, often offered on the weekends or during the summer, were amongst the most well-attended. One library offered a Cuban African drumming session as part of the Rhythm exhibit that turned into an outdoor performance lasting two and a half hours, enjoyed by over 65 people.

One librarian began offering regular "open houses" with her SITS exhibits, first offering a six hour session during a vacation day in which various stations of hands-on activities, along with a reading station, were used by over 39 children and adults. She later offered a multi-day open house during school vacation week that engaged over 425 patrons (approximately 325 children and 100 adults.) She found the multi-hour and multi-day Open House format particularly successful, to enable families of various schedules to attend, and to afford opportunities for repeat experiences for particularly interested patrons.

The evaluation notes from this librarian provides an on-going journal of library patrons' use of the exhibit, and the ways in which the special programs heightened and shifted visitors' use of the exhibit, with an interplay between exhibit, book collection and other materials, and special programs. The journal also nicely chronicles the ebb and flow of patrons' interest and use over the six-week duration of the exhibit, as well as the growing familiarity and expectations for SITS exhibits held by patrons.

6/20 Video is a magnet. This area is the first place everyone goes to when entering the children's room - habit or interest. Watching without video first.

6/22 Slow day. Several people at exhibit throughout. Mom and dad explaining what the birds are and their perception of video purpose. It's remarkable no one ever reads! "Oh here's a button – sound on."

6/27 There is no question what the video "does". Do not realize purpose of white button – no reading. Handling of wing "cool". Someone has found the volume on TV.

6/30 Exhibit seems to be a one-on one (more solitary) exhibit than others. Sometimes 2 or 3 gather to watch and listen. There is not a great deal of discussion as with others. The activity sheets have been quite popular.

7/13 The books with this exhibit have been quite popular. Many people look at them here and check them out. Videos doing well too. Very busy day –program this afternoon. Children's room mobbed. Many people milling and gathering everywhere.

7/16 Ran off more activity booklets. Discussion of past bird program [by visiting Audubon speaker] and anticipation of next [program]. More interest in exhibit. People are looking at it in different way it seems. More constructively.

7/17 People are actually listening to the video loop now. Talk and handling of wing. Some "grosses" but parents are becoming "discussion leaders".

7/20 Flight program (by Audubon on 7/19) has generated even more constructive interest in exhibit, rather than curious interest. These people are leaning to interact more it seems – within family,/playgroup and others around.

7/23: Questions about finding different kinds of information about birds – bird books are usually quite popular, but people are taking lots in connection with exhibit/program too. Great!

7/25 Pleased with this exhibit as far as patron reactions, usage and patron interactions with each other. Visitors are no longer overly excited with this, but use it a lot – to learn something.

7/27 People are asking again when will the next exhibit be here and what it will be!

Libraries faced challenges in providing high levels of quality, interactive science-oriented family programs. Not surprisingly, the libraries that were already the most active and being the best equipped in family programming offered the greatest number of SITS-related activities, incorporating them into their already extensive program offerings, or expanding current offerings to some degree.

Other libraries had fewer resources to offer children and family programming, or faced stiff competition for public attention with other community institutions and organizations, and did not have the strong base or reputation for programming in the community. All librarians expressed that they wished they had had more time and resources to devote to offering SITS programming. Many of the children's librarians were the sole staff member already responsible for offering a regular weekly story hour to children, occasional family programs, and a full summer reading program.   SITS programming

was in addition to all of these other responsibilities, although librarians strove to integrate SITS into regular programs as best they could.

Librarians were asked the extent to which they felt the SITS exhibit-programs enabled children and families to participate in a greater range of programs and activities in their libraries. Eight of the 12 librarians felt that children and familiar participated in at least "some" greater range of programs. This survey item was one that had the greatest range of responses from librarians.

Figure 2: Librarians' assessment of extent to which SITS expanded library's range of program ands activities

Program Qualities and Desired Impact	Librarians' Ratings (average/mean; range)
The exhibit-programs enabled children and families to participate in a greater range of programs and activities in our library.	3.20 (range: 1-5)

(Rating scale: 1 = Not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

As noted earlier, a number of libraries incorporated SITS themes and content into tried and true program formats, such as story-time, arts and crafts activities, or guest speakers and presenters.

Almost all of the librarians expressed a desire to have worked more closely with the Museum during the extensive phase of program implementation. They recognized their more limited background in presenting science-oriented family programming that was highly interactive in nature, having typically invited outside experts to cover special science topics. Many expressed a willingness and desire to learn how to provide such programming, but would have liked to have benefited from the Museum staff in learning how to conduct such programs A few librarians worked only part-time, which made it additionally difficult to pull off extensive program offerings of such a sustained nature (8 different topic programs over a full year).

As one library director expressed,

> *A major issue for us was lack of staff time to devote to various aspects of administering each exhibit. Additionally, we are not versed in scientific display, vocabulary, and projecting concepts with the knowledgeable enthusiasm they deserve. We did share with other local librarians some outside resource people who could come in and "do" programs for us and this was helpful.*

In general, SITS exhibits seemed to encourage a modest level of reading materials and books. One of the desired benefits of the SITS program was that the exhibits could offer a new vehicle for libraries to highlight some of their book collections, both fiction and non-fiction, that would lead to patrons' reading of the materials.

In general, most of the librarians felt that the SITS exhibits did not strongly encourage the children to read materials and books. Despite the superb, high quality books librarians

had selected for each exhibit, there was not typically a heavy circulation of the SITS core collection, nor of the related materials each library drew from its own collection.

Figure 3: Librarians' assessment of extent to which SITS encouraged patrons' reading of materials

Program Qualities and Desired Impact	Librarians' Ratings (average/mean; range)
The exhibits encouraged children and adults to read materials and books.	2.5 (range: 2-4)

(Rating scale: 1 = Not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)
(n = 8 lead librarians)

Seven of the eight lead librarians indicated that they felt that their library had experienced a relatively low level of borrowing and reading of their SITS core collections. When asked what the reasons might be for this, librarians described a range of different factors that might be at play. One of the factors cited was the challenges of where to locate the exhibit given that its book collection featured both juvenile and adult books. When exhibits were located in the children's room, children were not an appropriate audience for the adult books, while only adults who are parents were typically aware of the adult offerings. When the exhibit was located in the adult section of the library, children are not usually aware of the books, unless they happen to be using the exhibits. One librarian found that the circulation of the books increased when they placed the exhibit near the circulation desk. Another librarian experimented with placing a SITS video amongst the library's regular video collection, and somewhat ironically, found that circulation increased.

Other librarians cited patrons' hesitancy to borrow something they think is part of a special display, even despite signage that the books and materials are to be borrowed. In the initial phase of the project, the books were envisioned as being more widely circulated and were thus typically limited to one to two weeks (rather than a more typical lengthier borrowing period.) One patron was observed to take a book, and later return it to the exhibit display without borrowing it, once she had learned that the book only had a one-week circulation period.

Librarians also discussed a variety of other factors at play, such as patrons liking when a familiar topic (e.g., birds and tools) aligned nicely with a particular appropriate season, or the appropriateness of borrowing certain "how-to" books only when one was about to embark on such a project. One librarian felt that despite having a good science collection for children, that science books tended to be borrowed when motivated by a particular school assignment. Several talked about how most patrons tend to come for "entertainment" materials and not to do research, while one felt that some of the more abstract scientific concepts (e.g., color, resonance) did not strong match up with interests of the community.

Another librarian described the highly individual and subjective factors at play that influenced borrowing behavior:

> *I think that borrowing occurred when people's interest converged with a given topic enough to awaken further interest, enough to "binge" borrow – but that for many, engagement with the exhibit was "entertainment" enough. People's time is very precious and they may predetermine their borrowing amounts on some sort of subliminal time arrangement they have with themselves.*

A closer examination of the circulation patterns of three libraries indicated that about a third to a half of the core collection was borrowed, with slight increases over the baseline data. Individual titles were borrowed one to four times during a six-week period. One library reported consistently steady levels of borrowing of their SITS collection, while others noted certain titles and/or exhibits that seemed to elicit higher borrowing rates.

In spite of the relatively low level of circulation, a number of the librarians noted children and adults looking at the materials while at the library. Thus, the borrowing rate underestimates patrons' actual reading of materials. Several libraries actively encouraged the reading of materials through its programming. For example, several libraries featuring open-house program formats regularly featured amongst its hands-on stations at least one activity station that featured the SITS books. Another library with a regular after-school program featured monthly reading contests around SITS themes that encouraged reading of books not specific to the SITS theme. For example, for the Color Filters exhibit, children were asked to read books that had titles that began with the "letters" (ROYGBV) of the colors of a rainbow.

In addition to the SITS collections, the exhibits also featured brochures that could be taken home. A number of the librarians reported that patrons picked up take-home (high numbers from one library), as another indicator of reading interest sparked by the exhibits.

Project successes were defined in terms of community impact and professional and institutional growth. In their final surveys, librarians described the SITS project successes in terms of both community impact and expansion of professional and institutional capabilities. Impact on visitors was defined along similar dimensions described in librarians' initial surveys as what they found most exciting about the project. Mentioned were the library offering a new, more hands-on experiences and learning, and encouraging interactions between family members and others in the community:

> *People were pleasantly surprised to find a hands-on exhibit in the library and enjoyed trying them out. It offered another option for families and after-school kids of something to do while in the library.*

> *The project connected learning and books in a positive fun way.*

> *The public was able to see the library as having additional roles than being a "book place."*

It often seemed that it was a great stimulus for people to be teaching or cooperating with each other, sharing what their understanding of the purpose of the exhibit was...Very young children explaining what they knew with older children and adults, while students of various ages would listen in respectful silence as a mom explained to her young children how the exhibit "worked". Usually people in this community seem to be very private and stand-offish with each other.

SITS project begins to expand some libraries' capacity to serve community. In general, librarians viewed the SITS program as beginning to help expand the ways in which they serve their communities.   Several librarians noted how the SITS program has given rise to new ways they will now offer children's programs, make available hands-on experiences in their libraries, and work with other libraries.

I certainly gained some insights into how patrons will use materials provided for them. For instance, this summer the VT summer reading program had a nature theme. My experience with SITS told me that it would be more effective (I would reach more people) if I put out and left out for a couple of weeks hands-on projects (craft-type stuff) and supporting materials than if I tried to run a one-time program.

I think regular patrons got in the habit of checking out the space where the SITS exhibit was to see if there was something new and for the kids, to "play" for awhile. As a result, we have decided to keep the SITS exhibit area as an ongoing hands-on space. Every 6 weeks or so we plan to put out a new manipulative activity that will appeal to children ages 2-14. Because of the success of the structures activity, we'll start with materials of that type (various other building materials and blocks) and occasionally include some other materials for looking at and touching (e.g., rock collections, etc.). Some of the other librarians are thinking along these lines also and we may eventually rotate some materials among us. [Our local school] has some of the old science kits the Montshire used to lend out and we may see if any of these would be appropriate and available to us also.

Librarians gave a relatively modest assessment of the way the program increased their libraries' ability to promote program and presence in their communities, and to increase the number of library visitors who typically come to their libraries.

Figure 4: Librarians' assessment of extent to which SITS increased
library's community presence and outreach

Program Qualities and Possible Impact	Librarians' Ratings (average/mean; range)
The SITS project increased our library's ability to promote our programs and presence in our local community.	2.75 (range: 1-5)
The SITS project increased the number of library visitors who typically come to our library. .	2.0 (range: 1-3)

(Rating scale: 1 = Not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

In general, it appeared that the libraries tended to draw their regular circle of library patrons, but offered them alternative types of experiences than normally offered in the library.   There were some exceptions, with two of the libraries indicating greater increases in community presence and outreach.

One librarian expressed that the SITS project, and its partnership with the Montshire, had helped the library forge a new relationship with its school, and expose children to the library who would not have normally and to attract people of many ages.

> *One of the most significant successes has been the programs we did with the school. It was great to have the children explore the exhibits and activities. Some of these children would otherwise never go to the library. The exhibits captured the interest of people of all ages. It was neat to see how impressed visitors from out of town were with the exhibits being in the library.*

Several librarians expressed that they appreciated the Museum's help in initial press releases and promotion at the beginning of the program, but saw a need for more continued support and guidance throughout the remaining implementation of the program to sustain and increase public awareness and interest.

Evaluation Foci #2: Fostering genuine collaboration between museum and library professionals: Processes and challenges

The SITS project had a number of key structural and procedural elements that were designed to foster genuine collaboration between museum and library professionals. First of all, the project was co-directed by both the director of the Museum, and the director of the largest library of the eight partnering libraries. Second, the directors intentionally structured a number of key events meetings and exchanges between the staffs of the museum and the eight libraries, as described earlier.

During the project's earliest phases, through the initial librarian survey and discussion with participants, librarians expressed their sincere interest in collaborating with other libraries and not just with museum.   The SITS librarians typically only met several times a year at regional librarian conference held in the state, and rarely "crossed state lines" in

which Vermont and New Hampshire librarians talked and shared ideas and experiences. The chance to collaborate and contribute to a single project was a rare opportunity for the librarians, who sometimes felt isolated within their own libraries, and limited amount of regular contact with colleagues with mutual interest in children's collection and family programming.

In their final surveys, librarians indicated that they felt the collaborations and interactions between their libraries and both the Museum and the participating SITS libraries had been worthwhile and productive.

**Figure 5a: Librarians' assessment of the value of collaboration
with the museum and with other libraries**

	Librarian Ratings
To what extent do you feel the collaboration and interactions between your library and the **Montshire Museum** has been worthwhile and productive?	4.0 (n = 12)
To what extent do you feel the collaboration and interactions between your library and the other **seven SITS libraries** has been worthwhile and productive?	3.58 (n = 12)

(Rating Scale: 1 = not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

Two of the librarians expressed the value of the collaboration with the Museum and other libraries in the following ways:

> *It is nice to work with people that feel the same way as I do about children and their abilities. The Museum uses tools to help children learn and the library does the same thing. I also feel that it is important to teach children that the library is a fun place to be. The exhibits and working with the staff of the Museum has helped make that possible.*
>
> *It was good to meet the other children's librarians, especially the ones from further off. Now we "know" each other and when our paths cross at meetings, we have something in common that connects us. Also the four libraries involved in close proximity have been more committed to our regular meetings and perhaps we will work towards an annual meeting including all the libraries.*

Likewise, Museum staff also viewed the collaboration with the participating libraries quite positively.

**Figure 5b: Museum staffs' assessment of the value of collaboration
with participating SITS libraries**

	Museum Ratings
To what extent do you feel the collaboration and interactions between the Montshire and the 8 SITS libraries has been worthwhile and productive?	4.0 (n = 5)

(Rating Scale: 1 = not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

Two of the museum staff members expressed the value of the collaboration with the libraries in terms of knowledge gained about their shared enterprise of working to serve the public:

> *I think it was beneficial for the people involved with the same public to learn the constraints and opportunities each organization works under. Both libraries and museum have many things in common – such as both being "free-choice" learning environments; both seeking new and innovative ways to work with diverse audiences (ages, gender, socio-economic groups, etc.); both striving to break-down age barriers and work with families; and both attempting to create a public awareness of how their institutions are an integral part of a community's infrastructure..[Through this project, I learned] that library programming staff need more support and encouragement to development and implement family-friendly programming ..In order for hands-on programming to succeed in places like libraries, more material and staff support seems to be required.*

> *I think it made both those of us at the museum and at libraries think about each other differently. In many respects we try and serve the same audiences...It helped me think about how to approach programs for people who do programs differently. I also liked the connections with books the librarians put together. I have referred to their lists when I have worked on topics for museum programs.*

At the same time, both library and museum staff had suggestions for how the collaboration could be improved. Both sets of professionals felt that the project would have benefited with clearer and more realistic expectations of professional commitments and time during the early stages of the project, and a more realistic allocation of time and resources needed to address the full scope of this highly ambitious project (i.e., the design and implementation of eight different exhibit-programs and collaboration between nine different organizations (the Museum and the 8 libraries.)) In the early phases, there was only one museum designer responsible for designing and building all eight exhibits in a compressed six month period (including prototype and final product), who could not easily address all the demands of both the design work and handling all eight collaborative relationships.

During the implementation phase, librarians felt solely responsible for carrying out all SITS program activities. As noted earlier, many expressed a desire for greater involvement by the Museum staff, perhaps through presenting at least one of the SITS programs early on, or co-directing a program. They felt that such a greater role would have both assisted the librarians in their professional development to acquire such skills, and would have heightened public interest in the SITS program. As is, the sole reliance upon the library staff for program implementation was somewhat "trial by fire", and relied on the librarians' resourcefulness,, acquisition of new skills, and extra preparation, on top of their already full working loads. Not surprisingly, most librarians (other than those who were already providing daily after-school programming) would tend to "outsource" the science programs to visiting speakers and performers. One of the

museum staff educators responsible for designing program activities recognized this need for support by librarians and expressed that she wished there had been time budgeted for her to serve as a resource for librarians.

Librarians also felt that most Museum staff were largely removed from the libraries' program implementation, aside from the museum designer who was responsible for overseeing the safe transport and assembly of the travelling exhibits. As it turns out, several of the museum staff reported in their final surveys that they had seen a number of the exhibits in at least two to three different libraries, unbeknownst by library staff. Few of the museum staff had the opportunity to see the exhibits at the libraries in more remote towns from the Museum location.

Despite these challenges, both library and museum professionals expressed an interest in collaborating with each other's organizations in the future, acknowledging that careful crafting of project expectations and responsibilities were necessary for positive collaboration to occur.

Figure 6: Librarians' and museum staffs' interest in future collaboration

	Librarian Ratings
To what extent are you interested in having your library continue to collaborate with the **Montshire Museum** on future projects or programs?	3.58 (n=12)
To what extent are you interested in having your library continue to collaborate with **other libraries** that were part of SITS on future projects or programs?	3.90 (n = 11)
	Museum Ratings
To what extent are you interested in having the Montshire continue to collaborate with the local libraries on future projects or programs?	4.50 (n=3)

(Rating Scale: 1 = not at all; 2 = A little; 3 = Some; 4 = A good amount; 5 = Very Much)

Three project participants from the museum and library professions expressed the value of the collaboration as follows:

> *The project provided a context for having a number of library staff and museum staff get together to talk about issues of how they work as educational organizations in the community and although hard to measure. I believe that everyone involved came away with a changed awareness of what they are doing. Like many of the major school curriculum projects Montshire is involved with, I think this partnership would benefit from more years of iteration. We were seeing good things begin to happen, suggesting that the concept was sound, but the project was too short to get everything right in terms of understanding the collaborative issues and opportunities.*

As with any collaboration, collective discussions with regard to a similar goal is always positive. This allowed for new and creative ways to improve and to learn more about ourselves, those libraries and librarians from other participating towns as well as the Montshire with its role in the community. The concept of "hands on" inquiry with regards to "informational" inquiry would most likely not have been explored had this collaboration not taken place…The benefit for us really lies in the connection made with the people involved and the knowledge gained from the time spent discussing the project.

I think having the opportunity of being part of this was very exciting. We gained a lot of materials that we needed for the collection. We, along with patrons, learned a lot of scientific knowledge about the subjects of the exhibits. This collaboration could blossom in to something other institutions may consider doing in the future.

Recommendations

Design and Program Considerations for Exhibits for Library Settings

       Design exhibits so that they offer activity that is hands-on, intuitive to use, and invites creative and multiple strategies and outcomes.   The exhibit that was viewed as most successful in the library settings involved building with shapes to make structures, and attracted users of all ages. Users felt satisfaction whether they worked with it for a short time, or sustained activity for up to an hour, and often returned for repeat visits with the exhibit.

       Design exhibits so that they promote both individual exploration and group interaction. The SITS exhibits strongly supported both individual and collaborative ways of approaching exhibit interaction, and are to be commended for their design. Patrons were seen interacting with exhibits, both in solitary fashion, and in collaborating with others.   One of the most successful outcomes of the exhibits was the way in which they encouraged children and adults to talk and work with each other, some in communities where people tend to be more private and reserved.

       For family programming, choose exhibit topics and scientific phenomena that may relatively familiar and inherently captivating. Many adults are hesitant to experiment with exhibits that they find overly novel, confusing, or counter-intuitive in topic or in design, for fear of appearing uninformed or "dumb".   Some of these individuals may already be reluctant visitors of museums and libraries, making it especially important for exhibits to be as "user friendly" and naturally inviting as possible. The SITS exhibits featuring tools, birds, and structures were among the most highly appealing and successful attracting multiple audiences of all ages and educational backgrounds.

       Use sound and audio only when absolutely needed as a fundamental part of the exhibit, and make optional if possible. The noise level from one of the exhibits – Crankin' Rhythm – was an inherent part of the scientific phenomenon featured. However, an exhibit located near a librarian's desk entailed a librarian needing to listen to such sounds up to 40 hours a week, for six weeks. Libraries are generally quite quiet places, and moderate sound levels appropriate for a museum will resound in a library like a ticking clock at midnight.   Similarly, librarians appreciated having the audio be an optional feature for the Bird video, which patrons could still appreciate without sound. At times, earphones for exhibits or "hooded spaces" where sound might be contained might be considered.

       Make sure that all exhibits involving moving "machinery" or parts are child-proof and pre-tested for safety with young children under five years of age. Libraries are typically places where children read, listen, chat, or look at displays they do not touch. Parents are not accustomed to supervising children in libraries to make sure that they are physically safe, and librarians should not have to worry about children's use of equipment and "machines" with moving parts. Librarians had legitimate concerns about

safety, which could not be easily allayed without sufficient time for prolonged child testing prior to exhibit installation. Librarians noted several times when children's fingers got caught in moving disks of the Rhythm display (and since there was no "speed control", children liked to spin the wheels as fast as they could), while some moving "handles" in the Resonance exhibit were close to eye level of young children. Some school age children initially used some hard plastic color filters in the Color display as Frisbees. Children will not often be heavily supervised by their parent (particularly school age children who may come to the library alone for up to several hours a day), and exhibits need to be child-safe so that libraries need not worry about injuries and liability. Careful exhibit design, such as the Museum designer's foresight to make plastic pegs for the Structures exhibit large enough so that toddlers could not swallow them, is essential.

Recognize that building an audience of users takes time and sustained experience, and that there will be "ebbs and flows" over time. Interestingly, the exhibits librarians often selected as the most successful were typically ones that appeared in their libraries approximately six months after the first one in the series had began. Librarians' records kept for the evaluation note patrons' familiarity with, and expectations of, the SITS exhibits grew due to their cumulative experience with the exhibits. Similarly, some librarians note the natural rhythms of patron interest over a six-week exhibit.

Incorporate new project programming into some popular "tried and true" formats of libraries, rather than only new types of offerings. The SITS project was wise to identify familiar offerings such as preschool story-times, special family events, and arts and crafts activities: they already have ready made audiences consisting of regular library patrons, and are familiar formats with which library staff know how to deliver programming.

If SITS exhibits are distributed for future use in libraries, compile an annotated librarian resource and program guide. Participating SITS librarians offered a wealth of insights and ideas over the course of their implementation of SITS exhibits. This information could be well-utilized to yield a modified version of the program guide, based on librarians' experiences as well as on museum staff's further thinking given librarians' feedback.   Museum staff may also decide that exhibits could be slightly modified to enhance their design.

Experiment with techniques for maximizing borrowing and reading of exhibit books and materials: In many cases, the wonderful set of books and materials accompanying and displayed with each SITS exhibit tended to not be heavily borrowed. Try moving the exhibit to different locations of the library, such as nearer the circulation desk, or in a more heavily trafficked area.   Consider having two places for exhibit materials to be displayed – some on the exhibit, and some near the circulation desk with signage (e.g., "Enjoy the Color Exhibit? Try these at home.") Share tips that work with other library colleagues. Design programming activities that entail books to be used by patrons. Continue to make available brochures and other "consumables" that patrons will clearly know are for the taking.

Research various facets of the library process and facility: In addition to advance scouting of the library facilities for layout, planned placement of exhibit, and existing patron traffic patterns conducted by SITS museum staff, understand other "infrastructure" elements and processes inherent in libraries, such as the coding and processing of new books, circulation schedule and process, tracking of books and materials, and van transport for inter-library loans. Expect that each library may have a different system than that of a neighboring town, and that travelling exhibits and collections involving multi-state library collaborations may introduce additional complications to the system.

Consider alternative ways to structure project budget for travelling book collections: Projects might consider two separate strategies for purchasing exhibit-program materials: one for materials that travel with the exhibit, and one for materials that the library may want to keep at the end of the project. In some libraries, librarians selected appropriate, high-quality literature that they knew would go with the exhibit theme, but already owned copies of these materials. Thus, the materials stipend for exhibit was of limited use to the library itself, since they already owned the materials (unless they wished multiple copies). Consider having a "book swap" at the end of the project so that participating librarians may trade and exchange books they may already have, for ones they might like for their collections.

Building Sound Partnerships between Organizations and Successful Collaborative Projects

Build collaborations and partnerships by recognizing that they take time, energy, sustained commitment, **and budgeted resources**.   "It's all about relationships" is often heard when describing necessary ingredients for successful collaborations. Make sure that sufficient time, energy, and budget covers not only the early stages of forming a collaboration, but building and sustaining the collaboration. Projects should not reserve meetings and sharing sessions to the first phase of the project, but throughout the life of the project.   Meetings and get-together may even be offered on a more optional and informal basis, but will enable participants to regroup and strengthen collegial ties and shared commitment to the project. Without the building of the collaboration and collegial bonds, roles and relationships can easily revert to "vender/client", "program developer/program delivery", and "traditional museum outreach."

Carefully select the number of groups one takes on as initial collaborative partners. The SITS project, with its eight library partners, was a project of ambitious scope and timeframe, given time and budget guidelines of its funder. The museum designer had a compressed schedule of six months to develop eight different exhibits in collaboration with eight different library partners. An alternative model might have been to break the project into a pilot phase, involving only four libraries, which could have then each developed an exhibit that was circulated amongst the group. Efforts could then be "ramped up" during the second phase, such as having these exhibits then be passed onto a second group of four who would implement the exhibit-programs in their library,

while the initial four then co-designed more exhibits. Ideally, project resources are allocated so that participating librarians are partially relieved from some regular on-going duties, to take on these new roles and responsibilities as exhibit co-designers and mentors to other librarians attempting to implement new types of program experiences in their libraries.

Involve partnering organizations during the grant-writing and project conceptualization stage.   Identify the key organizations early on in the grant-writing stage, so that all major stakeholders have a voice in contributing to the vision, project objectives and tasks, timeline and projected budget.   Once a proposal is funded, it is usually difficult to scale back and formulate a plan that is not overly ambitious in scope, schedule, program expectations and outcomes.

Recognize the diversity amongst partnering organizations, and factor that into program expectations and program design. The eight partnering libraries embodied a wide range of opportunities and challenges, given the strengths, capabilities, and constraints of their institutions and the community they serve. Programs should be designed that acknowledge and embrace these differences, and take them into consideration when defining educational goals and programs, project responsibilities, and desired outcomes.

Build a strong base of support within each partnering institution. While each SITS library technically involved the library director and the children's librarian, the majority of the responsibilities and burden of the SITS project was placed upon the children's librarians.   If the goal of the project is to transform libraries into new centers of learning in the community, all library staff, from those involved in the circulation desk, to the reference librarian, to the volunteer staff, should be fully aware and supportive of the endeavor to best promote its impact within the community.   Support from top administrators (awareness as well as through resources and redefinition of job responsibilities) is essential, since new project responsibilities may require factoring in or substituting new project tasks upon already demanding work load already placed upon children's librarians.

New professional roles and responsibilities need to be developed and supported over time. If professional development of library staff is key to project success, it should be made explicit as a project goal, and resources allocated for that process. For the SITS project to be successful, librarians were asked to assume a key role entailing new ways of supporting family learning in science through exhibits and family programming. New methods of approaching program implementation and understanding patrons' learning needs does not simply come about when receiving a program package or resource guide. Librarians would have benefited from closer collegial relationships with Museum staff during the program implementation. For example, librarians might observe Museum staff lead a family science program in their library with their community during the initial phase of implementation, co-facilitate with Museum staff a later session, and then be observed by Museum staff in a session which they conduct on their own, much like how a new teacher might apprentice to a mentor teacher. Librarians

need to have more first hand experience with how science learning for families can be conducted successfully in their own communities, much like how museums offer on-site school programs as part of teacher training.

Similarly, it might have been possible for librarians to have learned from one another, and collaborated in different ways in the project. For example, librarians might have paired up and tackled a small subset of the SITS exhibit programs, and served as "guest workshop leaders" at other libraries. In this way, librarians would have the option of taking on less than the full array of eight science exhibit topics, collaborate with a partner, and parse the work in ways that might have been more manageable, much like how teachers sometimes co-teach in a grade-level team.

Work hard at making sure that the collaboration and information flow is "bi-directional". All dedicated professionals have something to share and learn from one another. It is sometimes easy for one group to feel that their expertise is more central or relevant to a program's goals than another's is. Make sure that there is equal opportunity for each organization to share and learn from another. In the SITS project, museum professionals had clear expertise in informal science learning, exhibit design, and focus on family learning. Similarly, librarian professionals had many insights to share about designing children and family programming in their communities, expertise about children's literature and non-fiction books, and first-hand knowledge of the ways in which individuals, families and groups come to the library to learn, enjoy, and interact over time. Many librarians shared impressively in-depth, insightful responses to our evaluation about the ways in which exhibits were used, over time, by different kinds of children and adults, in solitary fashion and in groups, and the ways it sparked, or failed to spark, new and important kinds of learning and exchanges amongst members of their communities.

Consider the benefits of project evaluation in obtaining a third-party perspective and assessment of collaborative arrangements and program success. A program evaluator can sometimes offer valuable third-party assessment of the ways in which collaborative partnerships can be improved, program objectives more precisely defined, outcomes clarified and specified, and target audiences better understood. Involving an evaluator from the onset of a project is optimal when a program entails both materials/exhibit design and implementation of programs, and/or needs to assess whether the building of collaborative partnerships and professional or institutional growth has been successful.

Distribute the allocation of resources and staff time so that they are available for both exhibit/materials design and program implementation. One of the lessons learned was that greater staff support from the museum partner was needed for the libraries to have the skills, experience and confidence to provide the desired levels of family-oriented science programming. Project plans and resources had been structured so that museum staff spent the majority of their effort during the design and development phase. Community impact and the strengthening of institutional and professional capabilities of libraries would have been enhanced through continued collaboration,

support and attention from the museum. Similarly, media promotion of the exhibits would have been optimal if sustained throughout the project's duration.

   Celebrate project successes, big and small. Institutional change, collaborative partnerships, professional development, and innovative programs are each alone extremely challenging, so recognize and reward the energy, commitment, perseverance and risk-taking of participants. Library and museum professionals appreciated the opportunity to get together and learn from one another during the initial phases of the project. Get-togethers, sharing sessions, communication, and positive acknowledgments of hard work are likewise appreciated throughout the course of the project, and at a project's completion.

(adapted from Montshire Museum press release)

Title (Topic)	Exhibit Description
Feathers and Flight (Birds)	Inquiry into how birds achieve flight. Videos of high-speed photography allow visitors to examine the subtle movements of bones, muscles and feathers that together enable a bird to fly. A mounted specimen invites visitors to feel the structure of a wing (and to discover the degree to which a wing is composed mostly of lightweight feathers, not muscle or bone). Layered drawings of the structure of a bird's wing reinforce this discovery, showing how the feathers, skin, muscles and bones relate to each other.
Dividing Time (Time)	Introduces the concept of dividing time into small units. A pendulum swings, marking off seconds and minutes, but a visitor sees that their own heartbeat or other natural rhythms can just as easily be used to divide their passage of time. Participants are able to compare the time units measured by their heartbeat with those of another visitor, and see how the second hand of a clock controlled by their own pulse rate measures time in a new way.
Shapes in Structures	Shows how different geometric shapes are used in construction. Visitors assemble common shapes used in building trusses to discover how well they can hold their own shape, and are invited to build a bridge utilizing some of the shapes to which they've been introduced.
The Colors of Light	Investigation into color filters. Visitors see that color filters admit only certain parts of the light spectrum and learn how combinations of filters transmit only the colors that the filters pass in common. Visitors manipulate small colored filters to view both color chips and images presented on a light box, and are encouraged to use filters to view their surroundings and each other.
Plumb-Level-Square (Tools)	Looks at the physics and mathematics behind some simple measuring tools. A carpenter's level works because a bubble in liquid rises to the highest point, indicating horizontal. Conversely, gravity pulls the weight of a plumb bob precisely towards the center of the arch, indicating "true vertical." A carpenters square uses the properties of a right triangle to indicate a true 90-degree angle. Visitors have objects to measure and parts to assemble their own angle-finders and levels.
Quick as a Wink (Reaction Time)	Visitors test the speed with which they can respond to something they see and/or hear. Visitors measure and compare reaction times using their dominant and non-dominant hand, and measure reaction times when they hear and see the stimulus.
Crankin' Rhythm	Shows the relationship between mathematical ratios and how they can be expressed as sounds. The exhibit features six wheels, which are turned by a hand crank. Pegs set into the rims of the wheels trigger sensors, which respond by emitting a sound or flash of light. Adjusting the position of pegs change the rhythm of the sounds and lights.
Resonance	Introduces the concept of resonance, the principal that applying small forces to an object at just the right time can result in large movements. A set of springy rods of varying lengths resonates according to the small forces gently applied by a visitor to an attached paddle.

Appendix B: Participating SITS Libraries

Howe Library (Hanover, New Hampshire)

Converse Free Library (Lyme, New Hampshire)

Fiske Free Library (Claremont, New Hampshire)

Lebanon Public Library (Lebanon, New Hampshire)

Richards Free Library (Newport, New Hampshire)

Tracy Memorial Library (New London, New Hampshire)

Norwich Public Library (Norwich, Vermont)

Lathem Memorial Library (Thetford, Vermont)