



# Vermont Early Literacy Initiative -- Science, Technology, Engineering & Mathematics (VELI-STEM) Project

Year One Evaluation Report  
December 2016

## THE VELI-STEM STORY

### *(Executive Summary)*

Once upon a time, there were 25 public librarians in rural Vermont who treasured what a wonderful resource their libraries were to their communities. They were passionate about serving children and families, and they relished opportunities to team up with others to embark on exciting new adventures. For instance, the librarians had partnered with local child care providers to give young children a rich literacy and mathematics grounding.

Unfortunately, these libraries did not have the special ingredients they needed to offer their community's most formative minds (young children) one of the most important learning experiences of the 21<sup>st</sup> Century – a grounding in STEM (Science, Technology, Engineering and Mathematics inquiry). Whatever were they to do?

Well, along came two wonderful resources for local libraries – the Vermont Department of Libraries and the Vermont Center for the Book, who teamed up with the 25 libraries to seek a little pot of gold from a wonderful federal agency called the Institute of Museum and Library Services, to help transform the libraries into STEM learning hubs for their communities. Over the past year, everyone has pulled together to match that pot of gold with their own treasures to set off on a magical journey. At the end of that journey, the 25 small, rural libraries will have: (1.) received advanced STEM training, mentoring, learning tools (such as picture books), hands-on learning methods and materials and other STEM resources; (2.) been trained to recognize opportunities to incorporate STEM learning experiences for young children and families throughout their library practice, including story hours, after-school programming, collection development, displays, “Discovery Science Centers,” newsletters and bibliographies; (3.) been given ample opportunity to access and contribute to an online STEM Clearinghouse of Resources developed throughout and after the project; and (4) transferred their newly acquired STEM knowledge and skills to community childcare providers through outreach and training programs so that providers will, in turn, introduce STEM learning experiences to the young children in their care.

While the final chapter of this story is yet to be written, it is certain to have a happy ending and, if you turn the page, you will see how far these libraries and their partners have already come in their magical STEM journey ...

### VELI-STEM Grant Award

*On August 31, 2015, the federal [Institute of Museum and Library Services \(IMLS\)](#) announced that the [Vermont Department of Libraries](#) received a three-year [National Leadership Grant for Libraries award](#) totaling \$339,861 to partner with the [Vermont Center for the Book](#) and [Montshire Museum of Science](#) in expanding the [Vermont Early Literacy Initiative \(VELI\)](#) in 25 public libraries by training librarians to provide STEM programming for young children, parents, and child care providers in science inquiry and physical science. IMLS funding runs from November 1, 2015 through October 31, 2018.*

**IMPROVED RECOGNITION BY LIBRARIANS OF EARLY CHILDHOOD STEM LEARNING OPPORTUNITIES**

– Librarian self-assessment of ability to recognize opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families throughout their library practices increased from a 3.9 prior to the project to a 4.7 after initial training in April 2016 (with 5 being fully proficient)

**INCREASED APPLICATION OF STEM KNOWLEDGE & SKILLS AMONG LIBRARIANS**

– Librarian self-assessment of proficiency at regularly providing opportunities for young children to use basic science increased from a 3.1 prior to the project to a 4.6 after initial training in April 2016 (with 5 being fully proficient)



**HIGH PARTICIPATION AND ENGAGEMENT IN STEM PROGRAMS**

– Over 3,700 in total participation of children, family members, child care providers and others among all STEM programs provided by the 25 libraries, with high levels of participant engagement:

- 82% of 3-7-year-old children reported as being “very” engaged in the STEM programs
- 73% of family members “very” engaged in the STEM programs

**INNOVATION IN DELIVERING STEM PROGRAMS**

– Utilization of a diversity of settings in the provision of STEM programming, trainings and outreach, such as community-based settings (e.g., a tractor pull at a community park) and other settings (e.g., take-home kits)



**CONSIDERABLE SUCCESS WITH LIBRARIAN TRANSFER OF STEM KNOWLEDGE AND SKILLS TO OTHERS**

– Among child care providers trained by librarians, 89% of survey respondents indicated the STEM training “very much” helped them develop a better understanding of what STEM means to children ages 3-7 years old and 100% introduced STEM learning experiences to the 3-7-year-old children in their care

**STRONG FOUNDATION OF ENGAGEMENT OF COMMUNITY STEM “RESOURCE PEOPLE”**

– Notable amount of STEM outreach conducted collectively by the librarians among a wide range of stakeholders (e.g., library trustees, town officials, local businesses and other key change agents) with over 570 stakeholders engaged

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## **YEAR ONE EVALUATION REPORT OVERVIEW**

This Year One Evaluation Report serves three main purposes. First, it is a progress report. It documents and assesses the strides made during the inaugural year of the three-year VELI-STEM project toward achieving the overarching goal of transforming librarian practice through the infusion of STEM content, skills and knowledge into all aspects of working with young children and their families.

Second, the Year One Evaluation Report is a project monitoring tool. It provides an assessment of the degree to which implementation during the project's pilot year went roughly along the lines of what the Vermont Department of Libraries, Vermont Center for the Book and their partners envisioned doing, as well as identifies necessary course corrections that have been or will be made.

Third, this report represents the beginnings of a "how to" guide (or a "how *not* to" guide) in support of replication by libraries across Vermont and beyond. It captures lessons learned (the evaluative content of this report) and compiles materials used (Addenda) in launching the project in Year One.

Two main areas of measurement occurred in Year One of the project, in support of the project's evaluation, implementation monitoring and broader replication:

1. Measurement of changes in STEM knowledge levels, including among librarians, children 3-7 years old, families/caregivers of children 3-7 years old, and child care providers/early educators of children 3-7 years old; and
2. Measurement of changes in behaviors, with the two main focal points including the infusion of STEM concepts and skills throughout regular library practices (i.e., collection development, ongoing programming, conversations, bibliographies, displays and community outreach) and the incorporation of early STEM learning experiences in child care/early education settings.

This report is structured around the project's nine objectives:

- ❖ **Objective 1: Recruit and train 25 librarians from rural communities in STEM content (Physical Science Through Inquiry), skills and knowledge over three years**
- ❖ **Objective 2: Develop and monitor an online STEM Clearinghouse of Resources for project librarians to access and inform during the three years of the project**
- ❖ **Objective 3: Investigate with librarians ways to recognize STEM language and concepts in picture books and other existing library resources, in order to be confident and competent in using this knowledge in ongoing programming**
- ❖ **Objective 4: Assist librarians in the infusion of appropriate STEM content into their regular practice, including collection development, ongoing programming, conversations, bibliographies, displays and outreach**
- ❖ **Objective 5: Provide librarians with non-fiction books, STEM resources and hands-on learning materials to be used throughout the library setting and in programming with**

children, families and childcare provider trainings and in the development of library “Discovery Science Centers”

- ❖ Objective 6: Support development of programmatic relationships between librarians and community STEM resource people
- ❖ Objective 7: Develop and promote a YouTube channel and other social media for librarians to use as resources and networking tools
- ❖ Objective 8: Evaluate efficacy of training and materials for refinement and dissemination of results, and for replicability
- ❖ Objective 9: Disseminate and promote project results.

For each objective, statistical and/or anecdotal evidence is provided on the progress made, challenges encountered and lessons learned during the pilot year of the VELI-STEM project. That evidence was collected from a variety of sources, including:

- Participating librarians
- Family members/caregivers who accompanied children at STEM programming
- Child care providers/early educators who were trained by librarians on early childhood STEM literacy
- Project leadership team members.

## YEAR ONE EVALUATION FINDINGS

### **Objective 1: Recruit and train 25 librarians from rural communities in STEM content (Physical Science Through Inquiry), skills and knowledge over three years**

**Librarian recruitment** – The Vermont Department of Libraries (VDOL) and Vermont Center for the Book (VCB) initially selected 25 libraries to participate in the three-year VELI-STEM project. Selection of the libraries was driven by six criteria, with an abbreviated analysis of the original sample in relation to the six criteria provided below.<sup>1</sup> Following that analysis, an additional library was enlisted to offset any future attrition and, indeed, one of the original 25 libraries later had to drop out of the project due to staffing transitions, leaving the target sample size of 25 libraries preserved as of the end of Year One of the project (October 31, 2016). The replacement library is somewhat more rural than the library that ceased participation, which skews the sample closer toward state average characteristics, such as size of population served and physical space.

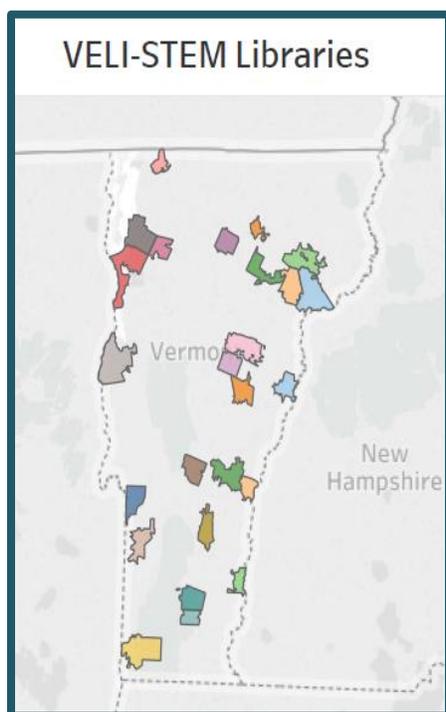
<b>SAMPLE SELECTION CRITERIA</b>	<b>ANALYSIS OF SAMPLE</b>
<b>Sample Selection Criterion #1</b> – Library’s prior or current involvement in the Vermont Early Literacy Initiative (VELI)	<i>The 25 VELI-STEM libraries, which represent approximately 50% of the over 50 libraries that have participated in VELI statewide, have opportunities to leverage certain skills and knowledge acquired through their VELI participation.</i>
<b>Sample Selection Criterion #2</b> – Library’s willingness and ability to participate in VELI-STEM	<i>Three-year commitment letters were signed by all 25 libraries, attesting to the full endorsement of each library's director and trustees. As a group, the 25 libraries have higher than the state average physical space and operating hours.<sup>2</sup></i>
<b>Sample Selection Criterion #3</b> – Library’s location in a rural setting	<i>All Vermont public libraries meet the criteria for a rural designation except for Fletcher Free Library in Burlington, which is not participating in the VELI-STEM project. The average population served by each of the 25 VELI-STEM libraries is approximately 5,600.<sup>3</sup></i>
<b>Sample Selection Criterion #4</b> – Achieving a sample with a geographic mix of locations	<i>The map on the following page depicts the intentionally disbursed geographic distribution of the 25 participating libraries. An <a href="#">interactive version of the map can be accessed by clicking here</a>, and hovering a mouse over each colored location on the interactive map will display a pop-up window with the library and town name.</i>

<sup>1</sup> NOTE: The VELI-STEM sample analysis was conducted in March 2016, based on the original sample of 25 libraries selected for participation in the VELI-STEM project. That full analysis is contained in [Addendum A](#).

<sup>2</sup> Data obtained from the Vermont Libraries Fiscal Year 2014 report.

<sup>3</sup> Ibid.

<p><b>Sample Selection Criterion #5</b> – Achieving a sample with a variety of library staffing models</p>	<p><i>Some of the 25 VELI-STEM libraries are single-librarian libraries, while others have multiple library staff, with a range of 0.4-8.7 FTE.<sup>4</sup></i></p>
<p><b>Sample Selection Criterion #6</b> – Supporting replicability of VELI-STEM in other libraries in Vermont and across the United States</p>	<p><i>While the sample of 25 VELI-STEM libraries have slightly higher average values as a group than average values for all state libraries as a whole on a range of measures, such as size of population served, FTE quantity and quality (percentage with MLS), and total operating income, the resources of the 25 sampled libraries would still be considered modest. Therefore, the model being used in the VELI-STEM project should be replicable by a majority of similarly or more highly resourced Vermont public libraries, as well as by rural and smaller urban libraries of comparable resources around the country.<sup>5</sup></i></p>



**LIST OF 25 VELI-STEM LIBRARIES AS OF END OF YEAR ONE OF PROJECT (October 31, 2016)**

- |   |  |   |  |
|---|--|---|--|
| <a href="#">Ainsworth Public Library</a><br>(Williamstown)        | <a href="#">Aldrich Public Library</a><br>(Barre)          | <a href="#">Bennington Free Library</a>                 | <a href="#">Bixby Memorial Free Library</a><br>(Vergennes) |
| <a href="#">Bradford Public Library</a>                           | <a href="#">Burnham Memorial Library</a><br>(Colchester)   | <a href="#">Chelsea Public Library</a>                  | <a href="#">Cobleigh Public Library</a><br>(Lyndonville)   |
| <a href="#">Craftsbury Public Library</a>                         | <a href="#">Fletcher Memorial Library</a><br>(Ludlow)      | <a href="#">Hartland Public Library</a>                 | <a href="#">Highgate Public Library</a>                    |
| <a href="#">Jamaica Memorial Library</a>                          | <a href="#">Jeudevine Memorial Library</a><br>(Hardwick)   | <a href="#">Lanpher Memorial Library</a><br>(Hyde Park) | <a href="#">Milton Public Library</a>                      |
| <a href="#">Norman Williams Public Library</a><br>(Woodstock)     | <a href="#">Pawlet Public Library</a>                      | <a href="#">Pope Memorial Library</a><br>(Danville)     | <a href="#">Poultney Public Library</a>                    |
| <a href="#">Rockingham Free Public Library</a><br>(Bellows Falls) | <a href="#">Sherburne Memorial Library</a><br>(Killington) | <a href="#">St. Johnsbury Athenaeum</a>                 | <a href="#">Wardsboro Public Library</a>                   |
|   |  | <a href="#">Westford Public Library</a>                 |  |

<sup>4</sup> Data obtained from the Vermont Libraries Fiscal Year 2014 report.

<sup>5</sup> Ibid.

Approximately one third of the librarians who are the main point of contact for the VELI-STEM project hold the primary role of library director, while approximately two thirds hold the primary role of children/youth services librarian. Time spent working in those roles averages 30 hours per week, with a range of 11-40 hours per week.

**Librarian training** – Librarian trainings that were conducted during Year One of the VELI-STEM project are summarized here, with more specific librarian training details relevant to [Objective 3](#) (librarian recognition of STEM language and concepts in library resources) and [Objective 4](#) (librarian infusion of appropriate STEM content into regular library practice) provided under those objectives.

The first librarian training in Year One took place on April 25 and 26, 2016 at Lake Morey Resort Conference Center in Fairlee, Vermont, for the 26 librarians participating at that time in the VELI-STEM project. The focus of that initial training was Physical Science Through Inquiry: Force and Motion, and the intended outcomes were three-fold:

- Increase participants' understanding of inquiry;
- Increase participants' understanding of force and motion as a focus for inquiry;
- Enable participants to design force and motion inquiry experiences on their own.

Training was conducted through a blend of lecture to the full group and active, small-group, hands-on activities in small groups. The STEM content that was delivered and the main deliverers of that content included<sup>6</sup>:

- Inquiry-Based Explorations of Force and Motion –
  - Karen Worth, Chair, Elementary Education Department, Wheelock College
  - Greg DeFrancis, Associate Director and the Director of Education, Montshire Museum of Science
- Introduction to the [VELI-STEM Clearinghouse of Resources](#), along with an overview of other STEM resources on the project's [VELI-STEM Weebly website](#)
  - Wendy Martin, Associate Director, Vermont Center for the Book
  - Mara Siegel, Continuing Education Coordinator, Vermont Department of Libraries
- Force and Motion Discovery Centers
  - Karen Worth with project team
- Marble Runs Maker Space and Exploration
  - Project team
- Introduction to [Program Templates](#)<sup>7</sup> & Planning
  - Sally Anderson, Executive Director, Vermont Center for the Book
  - Small groups
- Distribution of STEM books and materials<sup>8</sup>

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<sup>6</sup> The full agenda for the Year One training conference is included in [Addendum B](#).

<sup>7</sup> See [Addendum C](#).

<sup>8</sup> For details on the books and materials distributed at the April 2016 librarian training, refer to the section on [Objective 5](#) on providing librarians with materials for STEM programming and trainings.

- Congressional Delegation and Promotion of the Project<sup>9</sup>
  - Representative for Senator Bernie Sanders
  - Tess Adone, (former) Executive Assistant to the State Librarian
  - Sharon Colvin, (former) Youth Services Consultant, Vermont Department of Libraries
- Evaluation Requirements of the Project
  - Wendy Martin
  - Sharon Colvin

The curriculum used to support discussions of scientific inquiry and preschool children at the April 2016 training was excerpted from *Worms, Shadows and Whirlpools* by Karen Worth et al, published by Heinemann.

On October 18, 2016, the second Year One convening of librarians was held – again, at Lake Morey Resort in Fairlee. Unlike the April 2016 conference, where the focus was more on training librarians and launching the project, the October convening was more of an opportunity for the project leadership team to reinforce key STEM constructs, take stock of Year One activities and progress to date, facilitate an exchange among librarians of helpful information and suggestions on effective STEM-infused library practices going forward, and gather essential feedback for course corrections. The initial activity at the October 2016 gathering utilized the following four feedback-generating topics/questions, librarian input on which was discussed in brainstorming sessions:

1. What did you do? What materials did you use? How many times did you do the same (or a similar) program?
2. Childcare and family programs – how did you recruit?
3. Discovery/learning centers & in-library displays – anything you created for VELI-STEM?
4. What would you do differently? What would you change? What would you do again?

Also, new STEM books and materials were distributed<sup>10</sup> to the librarians, which provided the basis for small-group brainstorming sessions on STEM programming ideas. In addition, time was devoted at the October 2016 gathering to engaging in extensive discussion and review of evaluation requirements.

The Year One budget for the training venue for both the two-day April 2016 training and the one-day October 2016 conference was \$11,484, and this budget was not exceeded. As part of the project budget, STEM experts and trainers received a per diem to develop STEM content and deliver the training, ranging from \$563 to \$1,000 per diem. There were no audio-visual fees, nor was there transportation reimbursement. In helping to underwrite the trainings, Vermont Center for the Book is providing an in-direct cost share amount of \$2,500 each year. Because the VELI-STEM project is intended to be a replication model, the project team tried to

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<sup>9</sup> Refer to the section on [Objective 9](#) and to [Addendum D](#) for more details on the promotion and dissemination of project information, including the Communications Plan that was rolled out at the April 2016 training.

<sup>10</sup>For details on the books and materials distributed at the October 2016 librarian training, refer to the section on [Objective 5](#) on providing librarians with materials for STEM programming and trainings and to [Addendum E](#).

keep book and material expenses to a minimum so that any library, no matter its size or location, can afford to implement the project.

## **Objective 2: Develop and monitor an online STEM Clearinghouse of Resources for project librarians to access and inform during the three years of the project**

A comprehensive [VELI-STEM website](#) has been developed and hosted on a Weebly platform that is publicly accessible through the [Vermont Department of Libraries website](#). The [VELI-STEM website](#) serves a number of important purposes, including linking VELI-STEM librarians to essential project and other related STEM resources, establishing an on-line presence for the project and supporting replication of STEM-infused library practices across Vermont and beyond. The [VELI-STEM website](#) includes a wide array of resources, ranging from training information and program resources (glossary, book lists) to administrative and evaluation forms to photos and links to VELI-STEM libraries.

The [VELI-STEM website](#) also hosts the [STEM Clearinghouse of Resources](#). The VELI-STEM project grant proposal called for the Vermont Department of Libraries, in partnership with the Vermont Center for the Book and the Montshire Museum of Science, to identify, validate and adapt the strongest hands-on STEM activities already available and compile them into an easy-to-use, online and interactive [STEM Clearinghouse of Resources](#) for VELI-STEM librarians, who – in turn – would inform the content of the Clearinghouse based on their own experience with successful STEM-infused library practices. Initially developed from January through March 2016, the Clearinghouse is organized by project year topics (e.g., Year 1: Force and Motion). For Year One, the six main areas covered by the Clearinghouse included: [Activities](#), [Bibliography](#), [Professional Reading](#), [Standards](#), [STEM Activity Ideas](#) and [What is Science for Young Children?](#)

- (1.) The Year One [Activities](#) page contains the [Year One Program Template](#) (additional details provided on the following page).
- (2.) The Year One annotated [Bibliography](#) lists fiction and non-fiction picture books on the topics of Force and Motion, STEM Inquiry and Problem Solving.
- (3.) The Year One [Professional Reading](#) page contains annotated links to STEM activities and information posted by organizations such as the National Science Teachers Association, National Association for the Education of Young Children and the American Library Association.
- (4.) The Year One [Standards](#) section talks about the importance of education standards and addresses the Next Generation Science Standards, as well as includes an annotated link to the Massachusetts Preschool Science and Technology/Engineering Standards for children ages two to five.
- (5.) Annotated links also have been posted in the Year One Clearinghouse [STEM Activity Ideas](#) section. VELI-STEM librarians have been encouraged to visit this page regularly for ideas about adaptations of a variety of STEM activities for a variety of ages and audiences. This section will be updated continually throughout the project.

(6.) At the VELI-STEM training in April 2016, Karen Worth presented PowerPoint slides on the topic of [What is Science for Young Children?](#), and that presentation has been posted to the Year One section of the STEM Clearinghouse for librarians to review as needed.



In addition to the Clearinghouse being a go-to resource for VELI-STEM librarians, librarians have been asked to complete [Program Templates](#) throughout the first project year (librarians provided input on the content of the template at the April 2016 training). The Vermont Center for the Book will edit completed program templates for consistency and post them on the VELI-STEM website to make program activity and story hour ideas widely accessible. A sample completed Year One template completed by Burnham Memorial Library is included in [Addendum E](#).

In addition to input on the program template that was posted on the [VELI-STEM website](#), librarians have had input on other website content, as well. At the April 2016 training, librarians were introduced to the [STEM Clearinghouse of Resources](#) and other STEM content on the Weebly site, including a tour of the content on useful activities and web links to STEM learning for preschoolers, all of which had been vetted by the Vermont Center for the Book. Librarians were encouraged to use the online STEM Clearinghouse to find already developed activities that they could use in their own libraries. In turn, librarians were given an opportunity to inform the development of STEM resources for dissemination on the Weebly site. For example, following their exploration of STEM Discovery Centers on the first day of the April 2016 training, librarians were asked to reflect on and respond to two questions:

- What are some elements of the Discovery Centers that made them strong, rich, fun?
- What are the criteria for making strong, rich fun activities?

The librarians' feedback to the two questions was compiled and posted on the VELI-STEM website as "[Elements of a Good Program](#)."

The STEM Clearinghouse and other STEM content on the Weebly site are useful resources not only for VELI-STEM librarians, but also for other librarians in Vermont and beyond, whether they work in remote and rural libraries or in large urban libraries. For instance, the site has

templates for creating “Discovery Science Centers” in libraries and other settings that serve young children (e.g., child care centers, schools) – even in facilities with limited space.

In addition to being a useful tool for disseminating STEM resources to librarians and others, the STEM Clearinghouse is an effective strategy for developing an on-line presence for the VELL-STEM project that can support replication. The VELL-STEM Weebly site averaged 118 visits per month from May through October 2016. The Vermont Center for the Book regularly reviews STEM content found on the internet and uploads links to information that might be useful to librarians.

**Objective 3: Investigate with librarians ways to recognize STEM language and concepts in picture books and other existing library resources, in order to be confident and competent in using this knowledge in ongoing programming**

At the Year One trainings, all of the instruction and hands-on activities were designed to increase awareness and comprehension of STEM language and concepts in books and other STEM materials, in order to foster confidence and competence in ongoing programming and trainings that librarians provide.

For example, on the first morning of the two-day April 2016 training, librarians engaged in a small group Force and Motion activity using ramps and balls. That activity will be discussed in greater detail below under [Objective 4](#) on infusing STEM content throughout library practice, but of relevance to [Objective 3](#) is that this inaugural training activity provided a guided opportunity for librarians to begin using STEM language and concepts in a hands-on way.

On the second day of the two-day April 2016 training, Sally Anderson introduced a [STEM Year One Program Template](#) to librarians, which was developed based on librarian feedback and questions from the previous afternoon session. Books and other materials were distributed to librarians at this point, providing an immediate opportunity to identify the STEM language that the materials contained and to build proficiency in using that language in the programming they were then asked to develop.

Librarians also received new books and materials at the October 2016 conference, after which they were assembled in small groups for facilitated brainstorming sessions on STEM programming ideas. Librarians were encouraged to continue providing inquiry programming over the months ahead and, after reviewing the new books and materials, they generated a list of possible programming ideas going forward.

The format of these training activities provided an immediacy to recognizing STEM language and concepts in the context of instantly applying that knowledge to program development. This, in turn, translated into librarian proficiency in using picture books and other existing library resources in STEM displays, activity centers and other STEM programming.



**Objective 4: Assist librarians in the infusion of appropriate STEM content into their regular practice, including collection development, ongoing programming, conversations, bibliographies, displays and outreach**

Year One trainings were designed to prepare librarians for infusing STEM content into their regular library practice, ranging from ongoing programming to outreach. For example, during the small group Force and Motion activity that took place on the first morning of the two-day April 2016 training, Karen Worth and Greg DeFrancis introduced the ramp and ball exploration with three questions/tasks to be explored by librarians:

- Open-ended challenge – what can you do so balls of your choice will reach a certain point but no further?
- What can you learn about the behavior of different balls rolling down the ramp? When they reach the bottom? How far they go?
- Make a ball go from one end of the room to the other, including a 90-degree angle.

Librarians were given 90 minutes for this exploration, at the end of which each group processed what they had experienced and how this would inform their programming, with Karen Worth and Greg DeFrancis adding helpful input. Worth then “made meaning” from the training activities with a PowerPoint presentation of “What is Science for Preschoolers?”



The afternoon of the first day of the April 2016 training, librarians were again assembled into small groups and guided to explore five Discovery Centers. The Discovery Centers were set up with instructions for each small group to flow through independently, including framing questions:

- What's possible in my environment?
- What questions can I ask children, families and child care providers?
- How many different ways can I do this activity?
- What are the multiple entry points for programming?
- What are the strategies in leading this activity with children, families and child care providers?
- What are the challenges for me and my library?

Each Discovery Center had a prompt/challenge, and each small group had an observer who remained at the station to be the note taker and, before rotating to the next station, each group had a mini-debriefing. The observers from each small group met briefly after the activity ended for a discussion of observations and comments from librarians. The next day of training began with the full group processing what librarians had experienced at the Discovery Centers the previous afternoon, with assistance offered on how to infuse STEM content into their regular library programming practice, as well as into their collection development, conversations with families and others who care for and interface with young children, and regular displays and outreach.



On the evening of the first day of training in April 2016, the entire group of librarians built marble runs from cardboard, masking tape and marbles, which provided yet another hands-on opportunity to learn how to infuse STEM content into library programming.

As already noted, the second day of the two-day April 2016 training included the review of a librarian-informed [STEM Program Template](#), after which librarians broke into small groups for planning programs and sharing strategies. Librarians were reminded to think about all the program possibilities, to keep focused on the real nature of inquiry in programming and to keep in mind other important considerations (e.g., community partners).

After the first STEM training in April 2016, librarians began piloting the infusion of STEM content into their regular library practice, including:

- Active (librarian-delivered) and passive (displays, discovery centers, circulating kits) programming for young children and families/caregivers

- Trainings for child care providers/early educators of young children
- Outreach to community stakeholders possessing expertise to help support the infusion of STEM content into library practices (STEM “resource people”)

Also, the April 2016 training equipped librarians with a set of STEM “lenses” for their on-going collection development, conversations and bibliographies.

When librarians reconvened in October 2016, they were given a chance to reflect more deeply on the STEM concepts and skills that they had acquired at the April 2016 training and that they had subsequently honed over six months (April – September 2016) through application of those STEM concepts and skills throughout their regular library practices.

**Objective 5: Provide librarians with non-fiction books, STEM resources and hands-on learning materials to be used throughout the library setting and in programming with children, families and childcare provider trainings and in the development of library “Discovery Science Centers”**

In Year One, librarians were provided with STEM books and materials at the April 2016 two-day training and again at the October 2016 one-day conference. Also, in the summer of Year One, Vermont Center for the

Book shipped supplemental books and materials for family programming, as well as resource cards for families. A list of all STEM materials and other resources distributed to librarians during Year One is included in [Addendum F](#). Also, a discussion of how librarians were trained on using the materials is included above under [Objectives 3](#) and [4](#).



## **Objective 6: Support development of programmatic relationships between librarians and community STEM resource people**

As previously noted under [Objective 1](#), the first criterion for selection of VELI-STEM participating libraries was prior or current involvement in the Vermont Early Literacy Initiative (VELI). Data that had been gathered previously from all participating VELI librarians indicated that the trainings and resources they had received as part of the VELI project had helped improve service delivery in their libraries and at community outreach sites, with regard to early literacy and mathematics. The 25 libraries recruited for participation in the VELI-STEM project out of the larger pool of VELI libraries had demonstrated appropriate use of VELI training and resources in local library programs. They had a proven track record of collaboration and outreach in the local community and an interest and ability to promote VELI-STEM to stakeholders, community members and other librarians.

Even outside of their VELI participation, the VELI-STEM libraries were conducting outreach as part of their regular library practice. They already perceived the library as a community resource for information, materials and programs and, in turn, see the community as a resource to their library for specialized expertise and resources.

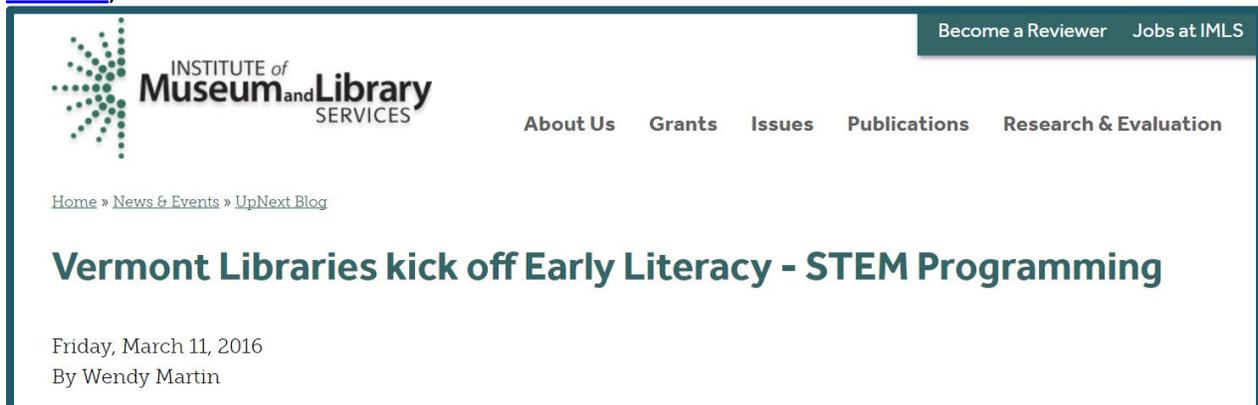
As part of their VELI participation, they were supported in serving children and families and offering outreach to local organizations, including child care programs. The VELI-STEM project has provided these librarians with opportunities to leverage their community engagement skills and knowledge acquired through their VELI participation.

That said, certain libraries struggled with trying to conduct outreach specifically to STEM resource people, on top of implementing other key components of the VELI-STEM project in Year One, but indicated that successful outreach should be more achievable going forward now that the project had been established and many conversations had been held within the community. Also, guidance was provided at the October 2016 conference and will continue to be provided on developing programmatic relationships with community STEM resource people.

## **Objective 7: Develop and promote a YouTube channel and other social media for librarians to use as resources and networking tools**

In order to provide librarians with ready access to STEM resources and networking tools, a variety of social media have been utilized. A VELI-STEM YouTube channel has been created, and the project leadership team plans to upload videos throughout the winter and spring of 2017. Also, a VELI-STEM Facebook (closed) group was created in April 2016, and member librarians have regularly posted photos from story hours and other STEM programming. In addition, the press conference announcing the VELI-STEM project in January 2016 has been posted on the [Vermont Department of Libraries VELI-STEM website](#) on the [Press Conference with Governor Shumlin - VIDEO](#) link to the [ORCA Media site](#), as well as on the [VELI-STEM Weebly site Press](#)

[page](#).<sup>11</sup> Another example of the VELI-STEM project's use of social media was a [blog post](#) on the project's launch from the Vermont Center for the Book that was featured by the Institute of Museum and Library Services (also posted on the [Vermont Department of Libraries VELI-STEM website](#)).



**Objective 8: Evaluate efficacy of training and materials for refinement and dissemination of results, and for replicability<sup>12</sup>**

**Year One Evaluation Overview** – Guided by the high-level evaluation plan synopsis that was included in the VELI-STEM grant proposal, a Year One evaluation plan was further developed by a data, research and evaluation consultant, in close collaboration with the leadership team during the early phase of the project's implementation. A one-page overview of Year One evaluation requirements was given to librarians in the fall of 2016. Additional evaluation guidance was given to librarians in person at the April 2016 training. Then, the evaluation consultant provided more detailed information, along with sets of instructions and data tracking and submission forms, via email immediately following the April 2016 training.

The Year One evaluation of the efficacy of training and materials was conducted using a variety of methods appropriate to each relevant type and source of data. In piloting the Year One evaluation methods, feedback was voluntarily offered by librarians and others providing data, as well as was solicited by the evaluator, leading to revisions to evaluation methods for Year Two of the project. A summary of Year One evaluation methods and Year One response rates for each evaluation tool is provided directly below, followed by a more detailed description of each evaluation method and corresponding findings.

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<sup>11</sup> [ORCA Media](#) is a local, non-profit television production facility operating in the Central Vermont areas, providing public, educational and governmental programming to the residents of the Central Vermont towns of Berlin, Bethel, Braintree, Calais, Duxbury, East Montpelier, Middlesex, Montpelier, Moretown, Randolph, Rochester, Waterbury and Worcester.

<sup>12</sup> Refer below to [Objective 9](#) for a discussion of dissemination and replication of project results.

<b>SUMMARY OF YEAR ONE EVALUATION METHODS</b>
<ul style="list-style-type: none"> <li>• Comparative analysis of STEM proficiency data from two on-line librarian surveys – <ul style="list-style-type: none"> <li>➤ Baseline (pre-project) survey on librarian proficiency in key constructs of the delivery of STEM programming to 3-7-year-old children</li> <li>➤ Post-training survey on librarian proficiency in key constructs of the delivery of STEM programming to 3-7-year-old children</li> </ul> </li> </ul>
• Analysis of quantitative data on STEM programming submitted by librarians
• Analysis of Family Member Survey data on their perceptions of the impact of librarian delivered/provided STEM programming on them and their child(ren)
• Analysis of on-site STEM programming observation data submitted by the VELI-STEM leadership team
• Analysis of quantitative data captured by librarians on child care provider trainings they conducted <sup>13</sup>
• Analysis of Child Care Provider Survey data on their perceptions of the impact of the training they received
• Analysis of quantitative and qualitative data on STEM community stakeholder engagement submitted by librarians

<b>YEAR ONE EVALUATION TOOLS</b>	<b>RESPONSE RATE</b>
Librarian completion of on-line Baseline Self-Assessment Survey	92%
Librarian completion of on-line Post-April 2016 Training Survey	100%
Librarian email submission of STEM Programming Data Spreadsheets	80%
Librarian submission of paper STEM Programming Surveys completed by family members	60%
Leadership team email submission of On-Site STEM Programming Observation Forms	100%
Librarian email submission of Child Care Provider Training Data Spreadsheets	84%
Child care provider/early educator completion of on-line STEM Training Surveys	25%
Library representation among completed on-line Child Care Provider Surveys	36%
On-line Community Stakeholder Engagement Data Form completed by librarians	88%
Leadership team email submission of administrative data	100%

<sup>13</sup> This data was only tracked during the snapshot period (April-September 2016) of Year One for the purposes of monitoring project implementation and will not be tracked in Year Two, now that findings from that data collection have been used to inform course corrections.

### Analysis of Librarian Proficiency in the Delivery of STEM Programming to 3-7-Year-Old Children

– In February 2016, an on-line Baseline Self-Assessment Survey was administered to the original 25 VELI-STEM librarians prior to receipt of any project trainings, in order to determine collective librarian pre-project proficiency in key constructs of the delivery of STEM programming to 3-7-year-old children. This created a baseline measure against which to compare future measurements, to help gauge progress toward and the final achievement of the following two project outcomes:

1. Participating VELI-STEM librarians are better able to recognize opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families throughout their library-based and community-based practice.
2. Participating VELI-STEM librarians are better able to transfer their acquired STEM knowledge and skills to community childcare providers through outreach and training programs so that providers will, in turn, introduce STEM learning experiences to the young children in their care.

After the two-day training in April 2016 on STEM Inquiry - Force & Motion, an on-line survey was administered to the 26 VELI-STEM librarians participating at the time, which measured almost identical constructs as those that were measured at baseline and as those that will continue to be measured along the course and at the end of the VELI-STEM project. Then, a comparative analysis was conducted of baseline and post-training survey findings, to determine if the training and materials provided to librarians resulted in an improvement in librarians' perceptions of their proficiency in key constructs of the delivery of STEM programming to 3-7-year-old children.

STEM Knowledge & Skills – Comparative Analysis			
Librarian self-assessment of their STEM knowledge and skill level on a *scale of 1-5	Baseline (February 2016)	After the Two-Day Training (April 2016)	Change in Percentage Points
Ability to identify opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families	3.9	4.7	↑0.8
Current regular provision (baseline)/intention of regular provision (post-training) of opportunities for 3-7-year-old children to use basic science practices (e.g., plan and carry out investigations, develop and use models, analyze and interpret data)	3.1	4.6	↑1.5
Sense of the different settings in which STEM learning experiences can be provided	3.8	4.6	↑0.8
Prior access to (baseline)/likelihood of using (post-training) STEM training and other resources (e.g., picture books, hands-on learning materials such as ramps and balls)	3.4	4.8	↑1.4
<b>Average Change =</b>	<b>3.6</b>	<b>4.7</b>	<b>↑1.1</b>
<b>Range of Change =</b>	<b>3.1-3.9</b>	<b>4.6-4.8</b>	<b>↑0.8-1.5</b>

\*Scale of 1-5, with 5 being fully proficient.

<b>STEM Concepts &amp; Delivery – Comparative Analysis</b>			
<b>Librarian self-assessment of their understanding of STEM concepts and delivery on a **scale of 1-5</b>	<b>Baseline (February 2016)</b>	<b>After the Two-Day Training (April 2016)</b>	<b>Change in Percentage Points</b>
STEM inquiry (e.g., broad skills related to asking open ended questions, using STEM vocabulary)	N/A (not measured at baseline)	4.5	N/A
STEM Water and Air concepts	3.7	N/A (not measured post-training since Year One not covering this concept)	N/A
STEM Force and Motion concepts	3.6	4.7	↑1.1
STEM Sound and Light concepts	3.2	N/A (not measured post-training since Year One not covering this concept)	N/A
What it means to engage children in science-learning opportunities within a context of science engineering practices (e.g., ask questions, define problems, plan and carry out investigations, construct explanations and design solutions)	3.5	4.5	↑1.0
How to encourage children to develop and use a range of science practices as described in the Next Generation Science Standards	2.3	3.9	↑1.6
How to transfer acquired STEM knowledge and skills to early childhood educators in library's community	3.0	4.2	↑1.2
How to conduct STEM outreach and informational exchanges with library's community (e.g., with library staff, directors and trustees; town officials; local businesses; and other key community members)	2.9	4.3	↑1.4
<b>Average Change =</b>	<b>3.2</b>	<b>4.3</b>	<b>↑1.1</b>
<b>Range of Change =</b>	<b>2.3-3.7</b>	<b>3.9-4.7</b>	<b>↑1.0-1.6</b>

\*\*Scale of 1 to 5, with 5 indicating that they strongly agree that they *have* an understanding (baseline) or a *better* understanding (post-training).

The last field of the post-training survey offered librarians an optional opportunity to provide open-ended comments about the two-day April 2016 VELI-STEM training and materials provided on STEM Inquiry - Force & Motion, with 22 (85%) of the 26 respondents offering feedback. The following key themes about specific aspects of the April training and materials and about the project overall emerged:



- Hands-on activities being essential [“Librarians really enjoyed doing the marble runs in the evening (it was an extremely active activity that everyone was able to do)”]
- Convenience of training location for most of the project librarians and its affordability and conducive layout for large groups to meet as a whole or in smaller groups
- Challenges encountered at the April 2016 training –
  - STEM content presented (force and motion) may have been ambitious for the first year of a project
  - Challenge of conveying what a “real” science program looks like (Karen Worth gave the example of programs for preschoolers about polar bears as not really being inquiry or science, because children can’t touch what they’re exploring, they can only read about polar bears)
  - Communications plan, as presented, potentially too ambitious for what librarians can be expected to achieve in a project of this scale (with concrete support – perhaps in the form of press release templates – librarians might be able to promote programs in their communities)
  - Insufficient time allotted to cover “nuts and bolts”/administrative/evaluation matters (which were later addressed at the October 2016 conference)
  - Certain Discovery Center materials being difficult to maintain at individual libraries, making training activities difficult to replicate (only materials that librarians will be given as part of the project will be used in future trainings)
  - Insufficient time allotted to demonstrating concrete explorations that librarians could replicate when they returned to their libraries (future trainings will provide greater coverage of that content).

The second librarian convening, which was held on October 18, 2016, was less of a formal training and more of an opportunity for the project leadership team to reinforce key STEM constructs, take stock of Year One activities and progress to date, facilitate an exchange among librarians of helpful information and suggestions on effective STEM-infused library practices going forward, and gather essential feedback for course corrections. The project leadership team captured key take-aways from the Year One fall librarian gathering, such as:

- Importance of an annual follow-up fall librarian convening to provide critical time for reflection on efforts made to date, as exemplified by this “ah-ha” moment – “One librarian had told us she had ‘not done much’ throughout the summer and seemed dejected. However, after the extensive discussion of what librarians had done, she said she realized she had really ‘done a lot of STEM!’ This time for reflection is crucial.”

*“After discussing the first year with librarians at the October [2016] conference and seeing the lists of what librarians actually accomplished programmatically, we were impressed by their first-year efforts, the quality of their programming, and how many children and families were reached.”*

VELI-STEM Project Leadership Team

- Changes requested to the evaluation and administrative components of the project, based on feedback on the piloting of data, financial and other forms and protocols from April to September 2016, with a few examples including –
  - Have all expectations spelled out clearly in advance
  - Simplify evaluation instruments and use on-line reporting
  - Capture data on a 12-month cycle, instead of only capturing a “snapshot” of data from April through September as was done during the roll-out of the project during Year One
  - More concise datelines.

**Year One Data Snapshots (April – September 2016)** – While feedback from librarians and the project leadership team on trainings and materials is an essential component of evaluating efficacy, the ultimate arbiter of the efficacy of trainings and materials is the quantity and quality of subsequent STEM-infused library practices. In other words, did the knowledge and skills that librarians and others indicate they acquired through trainings and materials actually translate into effective STEM-infused library practices?

To answer that more pressing question about the efficacy of trainings and materials on infusing STEM content throughout library practices, a snapshot of the following types of quantitative and qualitative data was captured starting immediately following the April 2016 training through the end of September 2016:

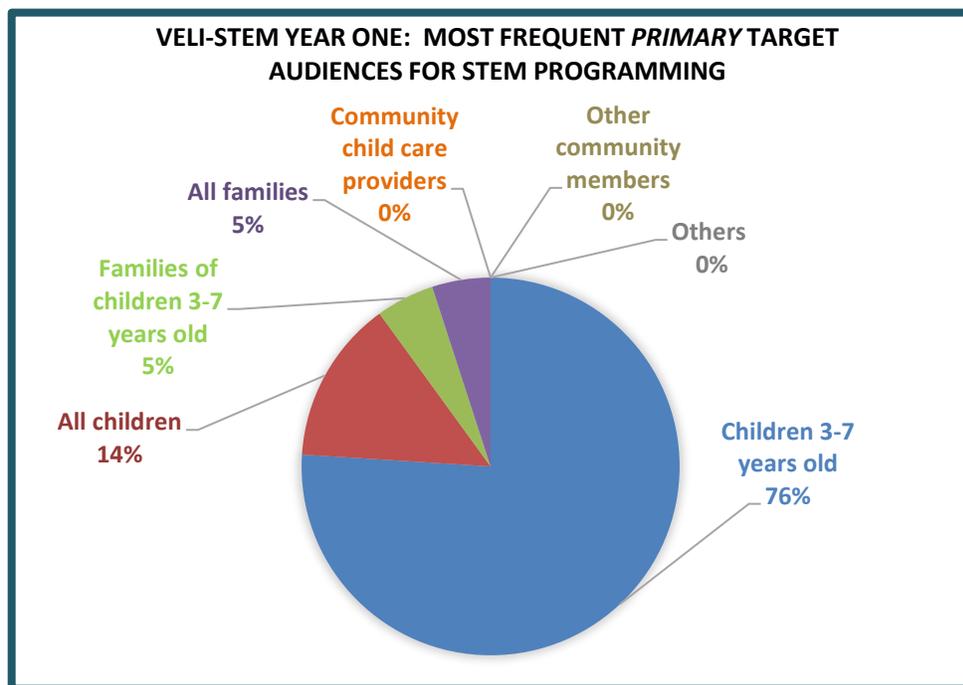
- A. STEM Programming (story times, family nights, hands-on displays, discovery centers, circulating kits, etc.)
  1. [Quantitative data captured by librarians on key characteristics of the programming they conducted/facilitated](#)
  2. [Family Member Surveys capturing qualitative feedback on programming in which they and their child\(ren\) participated](#)
  3. [Quantitative and qualitative data captured by the leadership team through on-site observations of the delivery of STEM programming](#)
- B. Training of child care providers/early educators on delivering early childhood STEM learning experiences
  1. [Quantitative data captured by librarians on the number of and attendance at child care provider trainings<sup>14</sup>](#)
  2. [Child care provider surveys capturing quantitative data and qualitative feedback on the trainings they received and how/if they applied their acquired STEM knowledge and skills](#)
- C. Outreach to STEM community stakeholders to engage them in supporting STEM-infused library practices
  1. [Quantitative and qualitative data captured by librarians on number and types of stakeholders engaged and their experience with STEM outreach.](#)

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<sup>14</sup> As previously noted, this data was only tracked during the snapshot period (April-September 2016) of Year One for the purposes of monitoring project implementation and will not be tracked in Year Two, now that findings from that data collection have been used to inform course corrections.

## Year One STEM Programming Data Snapshot (April – September 2016) –

- 21 (84% of) librarians provided STEM programming data, among whom:
  - There was a total of 198 STEM programs delivered
  - An average of 9 STEM programs delivered per library
  - A range of 3 to 19 STEM programs delivered per library
  - The distribution of the most frequently cited primary target audience for STEM programs was –
    - 76% Children 3-7 years old
    - 14% All children
    - 5% Families of children 3-7 years old
    - 5% All families
    - 0% Community child care providers
    - 0% Other community members
    - 0% Others



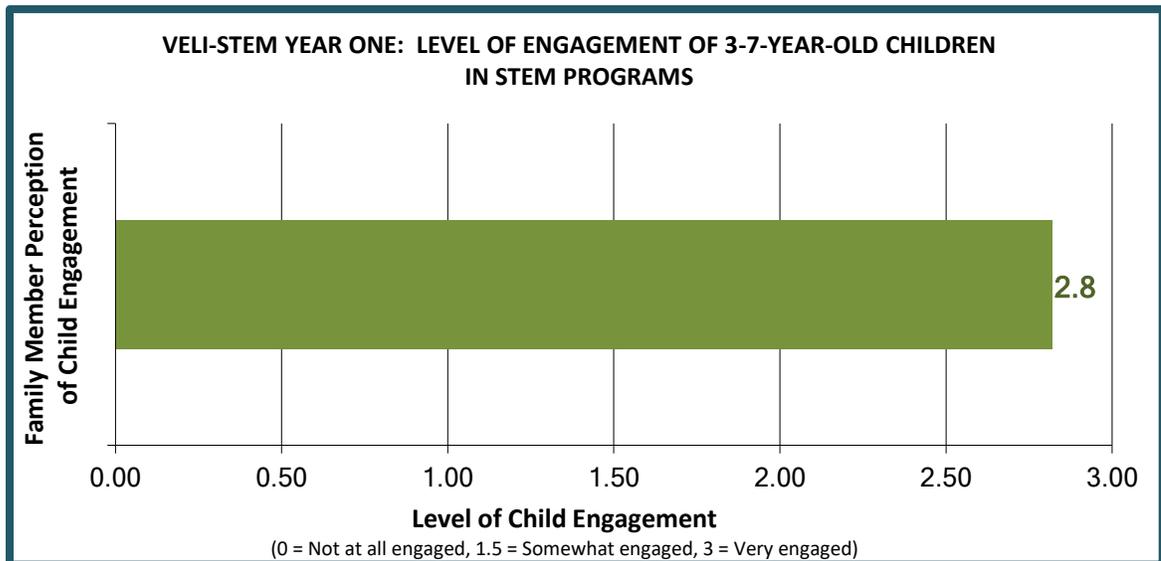
- While Community child care providers, Other Community Members and Others were not among the most frequently cited primary target audiences, librarians did target programs to those audiences. For example, one library selected “Others” as the target audience for one of her library’s STEM programs and noted:
  - “Delivered mini-workshop to library staff who are not in the VELI-STEM program, in order to equip them to deliver Force & Motion content to 3-7 year old children”
- Participation levels in STEM programming (i.e., total attendance beyond just primary target audience, with counts sometimes including the same participant more than once, if they attended multiple programs) were –

- 3,711 total level of participation in all STEM programs combined among all 21 libraries
    - 177 average total participation in all STEM programs per library
    - 47-751 range of total participation in all STEM programs per library
    - 18 average participation per STEM program per library
    - 6-40 range of average participation per STEM program per library
  - The distribution of the most frequently cited setting for STEM programs was –
    - 86% Library
    - 0% Child care program
    - 9.5% School
    - 0% Mobile venue
    - 4.5% Broader community
    - 0% Other setting
    - While Child care program, Mobile venue and Other setting were not among the most frequently cited settings for STEM programs, librarians did conduct certain programs in those settings. For example –
      - Some libraries selected “Other setting,” noting that the program was take-home kits.
      - Other libraries conducted programs in community and state parks, including at a tractor day held at a community park.
      - Libraries also delivered programs at a Town Meeting Hall, farmer’s market, summer camp, local child development centers and library lawn.
- Evaluation issues encountered with capturing STEM programming data and course corrections:
  - ISSUE: Low comfort level with using Excel data tracking spreadsheet
    - COURSE CORRECTION: Evaluator provided extensive technical assistance to librarians to improve their proficiency with using the spreadsheet.
    - COURSE CORRECTION: Evaluator simplified the spreadsheet for Year Two based on solicited and volunteered librarian input.
    - COURSE CORRECTION: Evaluator created a user-friendly on-line data entry form, which will be used at the end of each project year, rendering the Excel spreadsheet an optional tool for tracking data throughout the year.
  - ISSUE: Misunderstanding about which types of STEM programming data should be tracked
    - COURSE CORRECTION: Evaluator provided clarification to librarians throughout the project year and will continue to do so.
    - COURSE CORRECTION: Evaluator included a clarification of what defines a “STEM program” in the instruction sheet for Year Two.
    - COURSE CORRECTION: Project leadership team members provided extensive guidance to librarians throughout the project year and more intensively at the librarian’s October 2016 gathering, with on-going guidance to be provided going forward.

- ISSUE: Data not being tracked –
  - COURSE CORRECTION: Evaluation components of the project were heavily emphasized at the October 2016 training, which should improve librarian compliance with data tracking and submission requirements going forward.
  - COURSE CORRECTION: The evaluator will continue to maintain regular contact with librarians, and a member of the project team will send out regular reminders to librarians about evaluation requirements.
  - COURSE CORRECTION: Early in Year Two, a replacement for the former youth services staff member with Vermont Department of Libraries should be on-boarded, and that person will be instrumental in supporting data compliance.
  - COURSE CORRECTION: Simplification of data reporting forms and protocols for Year Two should support increased data compliance.

**Year One Family Member Survey on STEM Programming Data Snapshot (April – September 2016) –**

- 15 libraries submitted Family Member Surveys to evaluator
  - 209 total surveys were submitted
  - 14 surveys were submitted on average per library
  - 2-35 surveys were submitted per library
- Number of 3-7-year-old children whom family members accompanied at the STEM learning experience
  - 355 total (some children counted more than once if families attended more than one program)
  - 2 average
  - 0-20 range
- Number of other children whom family members accompanied at the STEM learning experience
  - 130 total (some children counted more than once if families attended more than one program)
  - 1 average
  - 0-20 range
- 485 combined total number of children of all ages in attendance at STEM learning experiences
- How engaged was (were) the 3-7-year-old child(ren) in the STEM program?
  - Average score = 2.8 [*on a scale of 1-3, with 0 indicating that the child was not at all engaged in the STEM program and 3 indicating that the child was very engaged in the STEM program*]
    - 82% Very engaged
    - 17% Somewhat engaged
    - 1% Not at all engaged



- Did the 3-7-year-old child(ren) receive a grounding in STEM knowledge and skills?
  - 70% Very much
  - 29% Somewhat
  - 1% Not at all
- How engaged were you [family member/caregiver] in the STEM program?
  - 73% Very engaged
  - 25% Somewhat engaged
  - 2% Not at all engaged
- Did the STEM program make you [family member/caregiver] feel more able to encourage the child(ren)'s interest in STEM?
  - 78% Very much
  - 22% Somewhat
  - 0% Not at all



- 99 family members/caregivers (47% of survey respondents) provided open-ended comments, which generally fell into the following themes (approximate frequency for the three most common themes cited in parentheses)
  - Kids and family members enjoying the program (“fun” and “enjoyed” cited over 25 times) – examples:
    - “I had no idea my daughter would enjoy rolling cars down ramps so much.”
    - “[My child] was disappointed it was over so soon!”
  - Family members/caregivers grateful for the program (some version of “thank you” cited approximately 20 times)
  - Wanting more regular programming (cited more than 6 times) – examples:
    - “As a homeschooler, I appreciate this program. I would like to see more like it.”
    - “More programs like this”
  - Family members/caregivers feeling more able to encourage the child(ren)’s interest in STEM – examples:
    - “[I learned to] ask open-ended questions and ‘I wonder ...’ statements to encourage independence.”
    - “[The librarian] put a block in front of a ramp some other children were building, so my daughter and I built a ramp too and tried to knock down a block with a cylinder shape rolling down the ramp. [The librarian] asked us questions about how we might try to build our ramp and before I knew it, we had modified the design to get it to work. It was not until after when [the librarian] told me about the VELI-STEM program that I realized we were doing STEM. We have blocks at home and I only thought about using them to build houses and buildings -- not ramps and paths and knock[ing] things down.”
    - “I was incredibly engaged in this [STEM] ‘play’ and will ‘play’ more at home like this with my daughters.”
  - STEM learning experiences equipping child with STEM concepts and skills – examples:
    - “My daughter used problem-solving to create the ramp at the best angles to have balls move -- worked with other children to brainstorm other ways to create space for balls”
    - “[My 3-7-year-old child] truly became interested in science. [Both of my 3-7-year-old children] walk around measuring things and writing numbers. Using math and engineering really helped [pique] more interest.”
  - Praise for materials used in programs – examples:
    - “It was TERRIFIC that the librarian could read the kids a STEM book while teaching them how to follow along. They learned science, math and reading skills!”

*“Who knew STEM could be so fun?”*  
Family Member/Caregiver

- “[My child] was very interested [in story hour] and I was surprised how much vocabulary she picked up!”
    - “Wonderful program – [my child] talked about the activities, read the books he was given at home and looked forward to each week!”
    - “[My child] always wanted to read her book and show us how to use the materials.”
  - Limited attention span of children, particularly younger children (3 year olds and younger being ranked as only “somewhat” engaged)
  - Lower ratings associated with respondents not providing their name
  - Frequency of providing open-ended comments correlated with particular libraries
- Evaluation issues encountered with surveying family members/caregivers and course corrections –
  - ISSUE: Limited number of families recruited for STEM programming
    - COURSE CORRECTION: At the October 18, 2016 training, librarians were given time to brainstorm how to better recruit families for programs.
  - ISSUE: Skipping the field “Number of other children you accompanied at the STEM learning experience” or mistaking it for a name or age field for the children they accompanied
    - COURSE CORRECTION: That field will require a response, which must be numeric, in the on-line version of the survey for Year Two
  - ISSUE: Librarians requesting an on-line Family Member Survey
    - COURSE CORRECTION: Evaluator developed a simplified process, instructions and forms for surveying family members going forward, including:
      - Making both an on-line and paper version of the survey available for librarians to use
      - Streamlining both the on-line and paper versions of the survey and making improvements to the survey based on issues observed with completion of the Year One paper survey
  - ISSUE: Libraries not submitting Family Member Surveys to evaluator
    - COURSE CORRECTION: See [course corrections regarding data not being tracked](#), which are listed under the Year One STEM Programming Data Snapshot

### **Year One On-Site Observations of STEM Programming Data Snapshot (April – September 2016)<sup>15</sup> –**

- 2 on-site observations were conducted in the inaugural year of the project (15% of total three-year target of a minimum of 13 observations), including observations of:

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<sup>15</sup> The VELI-STEM grant stipulates that the Vermont Department of Libraries and Vermont Center for the Book staff (i.e., the members of the VELI-STEM project leadership team) will inform the evaluator of anecdotal data collected as part of their on-site visits to observe family members and children engaging in STEM experiences and that the evaluator will triangulate this qualitative data with quantitative data to gauge how effective STEM programming is and to make any mid-course adjustments.

- 1 Active STEM Program – library story time conducted off-site with a preschool group
- 1 Passive STEM Program – STEM Discovery Centers in the children's room at a library
- Titles of librarians observed
  - 1 Director
  - 0 Assistant Directors
  - 2 Children's/ Youth Librarians
  - 0 Library Assistants
  - 0 Other library roles
- Settings in which STEM programming was observed
  - 1 Library
  - 1 Child care/early education program
  - 0 Schools
  - 0 Mobile libraries
  - 0 Community locations
  - 0 Other settings
- Approximately 13 total children 3-7 years old participated in the observed STEM active and passive programming
- Approximately 3 family members/caregivers (a grandfather and 2 preschool teachers) accompanied the 3-7-year-old children at the observed STEM active and passive programming
- Impact of active STEM programming (story hour at preschool)
  - How engaged were the 3-7-year-old children in the active STEM programming?
    - Very engaged
  - How much do you agree that the active STEM learning opportunities you observed contributed to 3-7-year-old children gaining a better understanding of Inquiry (e.g., broad skills related to asking open ended questions, using STEM vocabulary)?
    - Strongly Agree
  - How much do you agree that the active STEM learning opportunities you observed contributed to 3-7-year-old children gaining a better understanding of Force and Motion concepts (e.g., how objects move, what a ramp is and what it does)?
    - Strongly Agree
  - How engaged were the family members/caregivers accompanying the 3-7-year-old children in the active STEM programming?
    - Very engaged
  - Did family members/caregivers encourage the child's/children's interest in STEM during or after the active STEM programming?
    - Very Much
- Any issues with proficiency in the delivery of active STEM Programming
  - Assistance was needed to support the librarian in more proficiently delivering content on Inquiry

- No
  - Assistance was needed to support the librarian in more proficiently delivering content on Force & Motion concepts
    - No
  - Assistance was needed to support the librarian in more proficiently engaging 3-7-year-old children
    - No
  - Assistance was needed to support the librarian in more proficiently engaging families/caregivers
    - No
- Open-ended comments on active STEM programming (story hour at preschool):
  - “[The librarian] started with the non-fiction book *Move!* and showed pictures and introduced vocabulary, which [the librarian] continued to use during the activities. They then had a discussion about ramps and where you see them. [The children] counted, repeated new vocabulary and explored the basics of force and motion. It was a young group (all four-year olds), but the children had the opportunity to balance balls on gutters, observe and make ramps, extend ramps on the floor and try to knock over toys exploring force and friction. The room was large and all 12 children were able to gather around the demonstration table. [The librarian] brought materials for each activity and the children spent time ‘mastering’ the rolling and ramp building. The fact that 3 adults were actively involved in the activities, helping children manipulate the materials and talking and asking questions was important to the success of the experience. Children were focused and quiet during the reading. This group of children engaged in a very well-planned exploration. [The librarian] ended the program by gathering all the children together and reading the movement story. The group left to go out and look for ramps!”
- Impact of passive STEM Programming (STEM Discovery Centers)
  - How engaged were the 3-7-year-old children in the passive STEM programming?
    - Very engaged
  - How much do you agree that the passive STEM programming you observed contributed to 3-7-year-old children gaining a better understanding of Inquiry (e.g., broad skills related to asking open ended questions, using STEM vocabulary)?
    - Strongly Agree
  - How much do you agree that the passive STEM programming you observed contributed to 3-7-year-old children gaining a better understanding of Force and Motion concepts (e.g., how objects move, what a ramp is and what it does)?
    - Strongly Agree
  - How engaged were the family members/caregivers accompanying the 3-7-year-old children in the passive STEM programming?
    - Very engaged
  - Did family members/caregivers encourage the child's/children's interest in STEM during or after the passive STEM programming?



- Evaluation issues encountered with on-site observations and course corrections –
  - ISSUE: Transition with designated observer late in Year One causing a delay in the scheduling of on-site observations and, then, the subsequent challenges the replacement observer encountered in scheduling observations late in the project year (i.e., during the non-peak STEM programming period)
    - COURSE CORRECTION: Targets for total and annual on-site observations to be conducted have been clarified and a new person has been assigned for scheduling and conducting on-site observations throughout Years Two and Three of the project, including during peak STEM programming periods
  - ISSUE: Librarians wanting better documentation and sharing of the work they are doing
    - COURSE CORRECTION: After conducting on-site visits of STEM programming, the observer spoke with Karen Worth (one of the early STEM literacy experts involved in the project) about better capturing the libraries’ work through Documentation and Story boards, and they decided to incorporate the “hows and whys” of this documentation into the October 2016 conference
    - COURSE CORRECTION: The project evaluator has let the leadership team know that she is poised to modify the on-site observation form and/or process in any way that might help achieve better documentation and sharing of the libraries’ STEM programming
  - ISSUE: Difficulties faced by the observer in fully assessing STEM content development from just one visit at each library
    - COURSE CORRECTION: The leadership team has indicated that they may observe at least several programs at each library during Year Two, if the documentation and story boards do not make the extent of libraries’ content development more evident

**Year One Child Care Provider/Early Educator Training Implementation Monitoring Data Snapshot (April – September 2016) –**

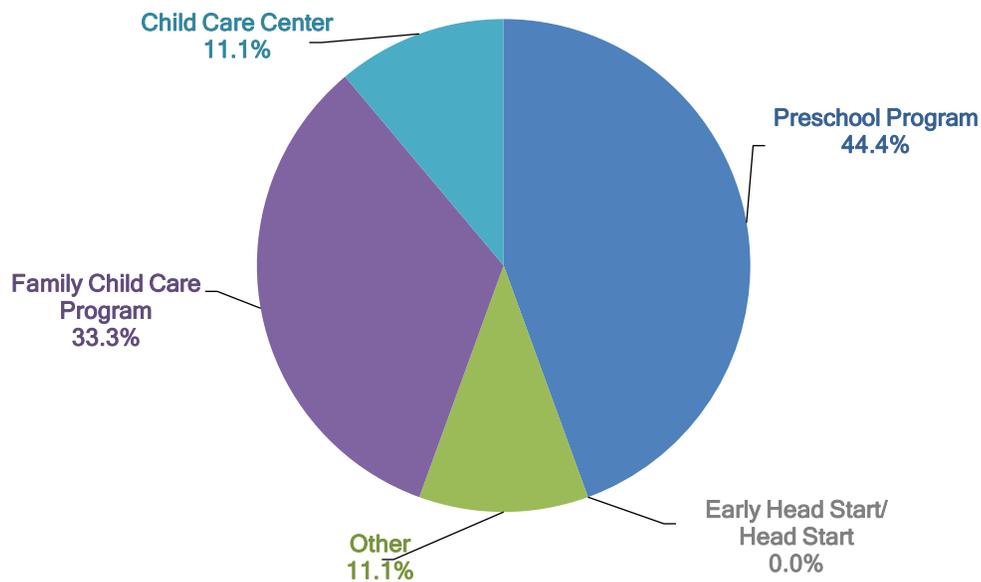
- Of the 25 VELI-STEM libraries:
  - 21 (84%) provided the evaluator with information on whether they conducted any provider trainings, among whom --
    - 16 (76%) librarians reported that they conducted trainings
    - 5 (24%) librarians reported that they did not conduct trainings
- Among the 16 librarians reporting that they trained providers –
  - 72 total providers were trained among all librarians
  - 5 providers were trained on average per librarian
  - 1 to 11 providers were trained per librarian
- Issues with training child care providers/early educators and course corrections –
  - ISSUE: Limited or no pool of child care providers/early educators for librarians to train within the library’s own community

- ISSUE: Lack of willingness or ability of libraries in nearby towns to partner with VELI-STEM sites in providing trainings to the providers in neighboring communities
- ISSUE: Lack of attendance by providers at trainings that were made available to them
  - COURSE CORRECTION: At the October 2016 conference, librarians were given time to brainstorm how to better recruit child care providers for trainings and programs. Also, more time will be given to reaching child care providers during future trainings.
- ISSUE: Lack of librarian time or confidence in early childhood STEM literacy acumen to conduct the trainings
  - COURSE CORRECTION: It was anticipated that librarians might not feel proficient enough in STEM concepts and skills to deliver training to others during the early part of the first year of the project from April through September 2016, but the follow-up training in October 2016 boosted librarian confidence in their ability to transfer their STEM knowledge to others, as will future librarian trainings on and experiences with STEM-infused library practices.

**Year One Child Care Provider/Early Educator Training Survey Data Snapshot (April – September 2016) –**

- 18 Child Care Provider Surveys were completed (25% of the 72 total trained providers)
- Of the 25 VELI-STEM libraries:
  - 9 (36% of) libraries were represented among completed Child Care Provider Surveys
- Of the 18 respondents, 9 (50%) provided their names, while the other 9 (50%) skipped that optional field
- Among the 18 respondents, the distribution of the type of child care/early education program with which respondents indicated they were affiliated was:
  - 8 (44.4%) indicated affiliation with a preschool program
  - 6 (33.3%) indicated affiliation with a family child care program
  - 2 (11.1%) indicated affiliation with a child care center
  - 2 (11.1%) indicated affiliation with an “Other” child care/early education program, including:
    - “Private preschool and kindergarten and child care center”
    - “Very small daycare in my home, 1 to 2 family's no more than 4 children at a time.”
  - 0 were affiliated with an Early Head Start/Head Start program

VELI-STEM YEAR ONE: TYPE OF CHILD CARE/EARLY EDUCATION PROGRAM OF TRAINEES



- For amount of training, the 18 respondents received:
  - 37 total hours of training received among all 18 respondents
  - 2 hours of training received on average per respondent
  - 1-5 hours of training received per respondent
- How much did the STEM training provided by your local librarian(s) help you develop a better understanding of what STEM means to children ages 3-7 years old?
  - Average score = 2.9 [on a scale of 1-3, with 0 indicating that the STEM training did not at all help the provider develop a better understanding of what STEM means to children ages 3-7 years old and 3 indicating that the training very much helped the provider gain a better understanding]
    - 89% Very much
    - 11% Somewhat
    - 0% Not at all
- Following the STEM training provided by your local librarian(s), did you introduce STEM learning experiences to the 3-7-year-old children in your care?
  - 100% Yes
  - 0% No
  - If Yes, approximate number of 3-7-year-old children involved in the STEM learning experiences you introduced?
    - 163 total number of 3-7-year-old children among the 18 providers
    - 11 3-7-year-old children on average per provider
    - 1-3 3-7-year-old children per provider
- 10 of the 18 respondents provided open-ended comments, which generally fell into the following themes:
  - High level of child engagement – examples:
    - “The children really enjoyed this training, although they didn't seem to pay much attention at the time. When parents came to pick up one little

- guy, he immediately got out the materials that were left by the library and showed his mother everything that was trying to be taught during the training. It was fantastic to see!”
    - “They believed we were playing a game all the while putting all I learn[ed] to use.”
  - Praise for the training – examples:
    - “This was a great experience. The children looked forward to the librarian ... coming. [The librarian] engaged each of them and I could see them beginning to think scientifically and ask those what if questions. Thank you!”
    - “We loved the hands-on learning, and how the learning and experiences gave way to discussion that included multiple subjects, without the children even realizing it. We also appreciated very much that the librarian came to our cite and how patient and understanding she was with the children and each of their learning styles.”
  - Application and utility of training – examples:
    - “Also, introduced STEM learning experiences to two 1 1/2 year olds”
    - “As a childcare provider without any college back ground these programs are very helpful to me for ideas for the kids in my small daycare.”
- Issues with surveying child care providers/early educators and course corrections –
  - ISSUE: Low response rate on child care provider/early educator survey [one contributing factor to which may have been the lack of immediacy resulting from waiting until the end of Year One to survey providers (i.e., the training was no longer fresh in their minds for many of them)]
    - COURSE CORRECTION: Evaluator created a new process where the librarians will administer an on-line or paper survey on-site immediately following the training (same process as Family Member Surveys)
  - ISSUE: Lack of willingness of providers to share their contact information with someone they do not know (the evaluator)
    - COURSE CORRECTION: Survey will now be administered by the librarian who trains the providers
    - COURSE CORRECTION: The name field will remain optional
  - ISSUE: Inaccuracies in email addresses captured
    - COURSE CORRECTION: No longer applicable since the survey will be administered directly by each librarian
  - ISSUE: Providers not having an email address due to lack of Internet access or usage
    - COURSE CORRECTION: No longer an issue, since librarians can provide a paper survey if they conduct a training where Internet is not available or provider is not comfortable using an on-line survey
  - ISSUE: Misunderstanding and lack of compliance among librarians with the requirement to capture child care provider contact information and submit it to the evaluator for future surveying purposes

- COURSE CORRECTION: Evaluator developed a simplified process, instructions and forms for librarians to use in doing their own surveying of child care providers going forward, as outlined above
- COURSE CORRECTION: See [course corrections regarding data not being tracked](#), which are listed under the Year One STEM Programming Data Snapshot

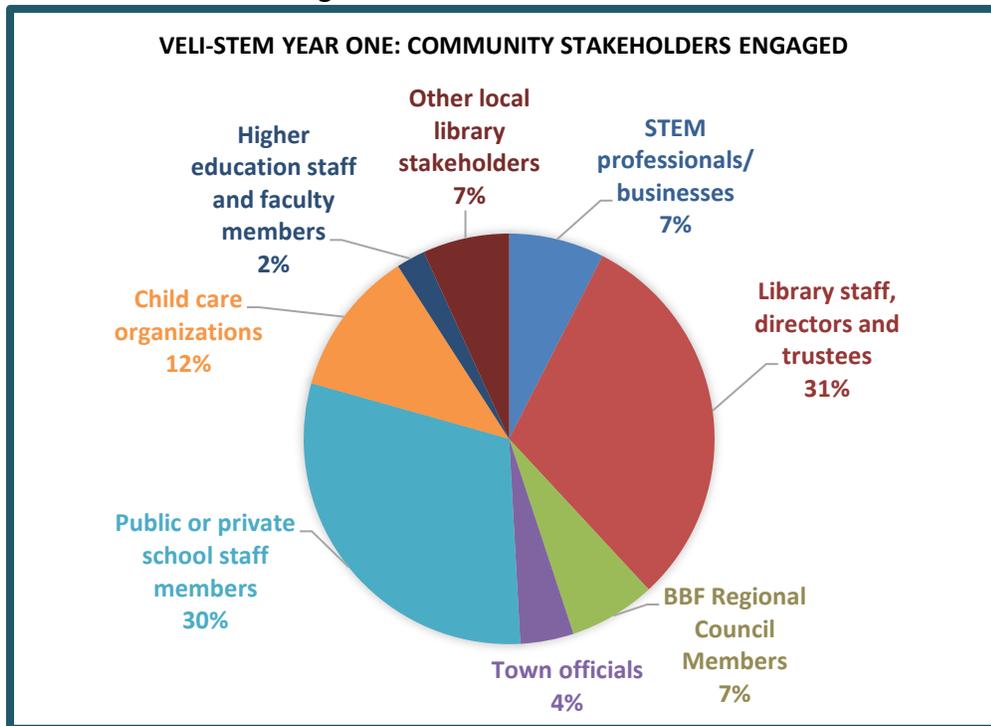
## Year One STEM Community Stakeholder Engagement Data Snapshot (April – September 2016)

- 22 (88% of) librarians provided data
- Cumulative statistics on stakeholders engaged
  - 572 total stakeholders engaged among all 22 libraries
  - 25 stakeholders engaged on average per library
  - 4 to 157 stakeholders engaged per library
- Types of stakeholders engaged
  - STEM professionals/businesses
    - 43 total (8% of 572)
    - 2 on average per library
    - 0-8 per library
  - Library staff, directors and trustees
    - 175 total (31% of 572)
    - 8 on average per library
    - 0-35 per library
  - BBF Regional Council Members<sup>16</sup>
    - 39 total (7% of 572)
    - 2 on average per library
    - 0-20 per library
  - Town officials
    - 24 total (4% of 572)
    - 1 on average per library
    - 0-12 per library
  - Public or private school staff members
    - 173 total (30% of 572)
    - 8 on average per library
    - 0-81 per library
  - Child care organizations (e.g., child care providers/programs engaged beyond training, such as members of Starting Points, VAEYC representatives, etc.)
    - 66 total (12% of 572)
    - 3 on average per library

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<sup>16</sup> [Building Bright Futures \(BBF\) Regional Councils](#) are a central artery in Vermont’s early childhood system of care, health and education. Regional Councils organize local communities to engage, plan and act. They disburse local, state, and federal funds to community programs and offer technical support so services to children and families are high quality, accessible and affordable. The purpose of this network of regional councils is to align solutions at the local level with effective policy at the state level. [Retrieved from the [Building Bright Futures website](#)]

- 0-20 per library
- Higher education staff and faculty members
  - 13 total (2% of 572)
  - 1 on average per library
  - 0-4 per library
- Other local library stakeholders
  - 39 total (7% of 572)
  - 2 on average per library
  - 0-15 per library
  - Types of “Other local library stakeholders cited” included –
    - Parents
    - Members of the arts community
    - Local high school & college students
    - Other public librarians
    - School librarians
    - Higher education administrators
    - Retired teachers
    - Hardware store staff
    - Web designers



- 55% of the 22 librarians who submitted stakeholder data also provided comments about their experience with STEM community outreach in Year One, with the most prominent themes including:
  - Challenges some librarians faced in trying to conduct outreach on top of implementing other key components of the project in year one [see course correction below] – examples:

- “It has been a slower process than I had imagined.”
    - “This may be easier to do with the next two installments. I was just trying to sort out how to make each piece happen this time around, never mind drawing in other people!”
  - Conversely, the ease with which other librarians engaged stakeholders – examples:
    - “I was amazed and surprised at all who stepped forward to help share their knowledge. All I had to do was ask!”
    - “People are happy to be asked, if you know who to ask.”
  - Appreciation for how vital stakeholder engagement is to the project – examples:
    - “Commitment and active involvement from key people in town is essential for this program to truly be a success.”
    - “Be grateful and thankful for their involvement.”
- Evaluation issues encountered with capturing community stakeholder data and course corrections –
  - ISSUE: Challenges in conducting outreach on top of implementing other key components of the project in Year One
    - COURSE CORRECTION: A number of librarians noted the considerable amount of time it takes to nurture relationships with community stakeholders to get them engaged in a new project, which is especially challenging while simultaneously devoting considerable time to implementing the other components of the project, but indicated that successful outreach should be more achievable going forward now that the project has been established and many conversations have been held within their community
  - ISSUE: Not enough guidance provided to librarians in Year One on reaching community partners
    - COURSE CORRECTION: Community outreach was addressed at the October 2016 training and will continue to be addressed
  - ISSUE: Creation of more than one on-line STEM Community Stakeholder data submission form per library
    - COURSE CORRECTION: Evaluator developed a simplified process for capturing community stakeholder data going forward
  - ISSUE: Misunderstanding about what data to capture on STEM community outreach
    - COURSE CORRECTION: Evaluator provided clarification to librarians throughout the Year One of the project and will continue to do so, as well as included clarification of what defines a “STEM community stakeholder” in the instruction sheet for Year Two
  - ISSUE: Data not being tracked
    - COURSE CORRECTION: See [course corrections regarding data not being tracked](#), which are listed under the Year One STEM Programming Data Snapshot

## Objective 9: Disseminate and promote project results

The dissemination and promotion of VELI-STEM project results supports transparency and fosters collaboration among the leadership team and librarians in the project's ongoing implementation and determination of important course corrections, as well as supports replication across Vermont and beyond. Project dissemination and promotion is achieved through several strategies, some of which have already been mentioned, but all of which are summarized here.

**Communications Plan & Efforts** – At the April 2016 training, the state librarian's executive assistant and youth services consultant presented an extensive communications plan for the project, which is attached in [Addendum D](#). Two tiers of communications strategies were laid out:

1. Strategies to be utilized by the project leadership team
2. Strategies to be utilized by librarians.

The first tier of communications efforts by the VELI-STEM project leadership team were kicked off by a press conference with Vermont's Governor in January 2016. A [press release](#) was distributed to media in advance of the press conference, and a handout was provided to the press at the event, which included an overview of the grant, a grant abstract, and a list of participating



libraries. The first tier of communications efforts also has included State Librarian Martha Reid's promotion of the project at [COSLA](#) (Chief Officers of State Library Agencies) and at other national and regional meetings throughout Year One. Project leadership promotional efforts will continue with coordinated statewide and national publicity through the media. At the end of the project's three-year period (October 2018), the Vermont Department of Libraries and Vermont Center for the Book will promote the VELI-STEM outcomes, materials and activities and will publish and distribute a final report on outcomes of the project, as well as on how participating librarians created their own local permutations and combinations of STEM-infused library practices.

The other tier of the communications plan revolves around efforts by individual VELI-STEM librarians. At the April 2016 training, a list of communications strategies was provided to librarians, outlining ways to infuse VELI-STEM promotional efforts throughout their regular library practice (e.g., use of social media to promote STEM-specific programming) and via focused VELI-STEM promotional efforts (e.g., presentations on their STEM efforts at state library meetings and conferences). Also, talking points were distributed to the librarians after the April 2016 conference so that they could discuss and promote the project with community

stakeholders (library trustees and directors, parents, school staff, etc.). Those talking points are included in [Addendum G](#).

Feedback from librarians at the October 2016 training indicated that the original communications plan as presented in April 2016 was perhaps too ambitious for what librarians could be expected to achieve in a project of this scale. That said, librarians expressed an eagerness to promote programs in their own communities, with concrete support from the leadership team, such as the provision of press release templates. The simplification of the communications approach should support a higher rate of promotion among VELI-STEM libraries and support replicability by other libraries.

Already in Year One of the project, an impressive array of strategies has been utilized by librarians to promote their VELI-STEM activities and involvement. Two of the VELI-STEM librarians attended the [ARSL](#) (Association for Rural and Small Libraries) conference in October 2016, participating in the STEM sessions at that conference. VELI-STEM librarians also networked with other librarians outside of the project to promote the infusion of STEM content throughout library practice. In addition, individual libraries generated press releases, local media coverage and posters on STEM programming (see examples in [Addendum H](#)).

**Web Presence** – As discussed earlier, libraries everywhere – no matter what their size, location or budget – will have access to the online [STEM Clearinghouse of Resources](#), [VELI-STEM website](#), YouTube channel, Blog and other publicly accessible, user-friendly STEM resources throughout the term of the project (and beyond) to learn how their peers have incorporated rich, hands-on and open-ended science learning experiences for children, their families and community childcare providers into their library programming.

**Congressional Delegation** – At the April 2016 training, representatives from Vermont’s congressional delegation had been invited to speak briefly after lunch. However, an unexpected snowstorm in the morning precluded all but Senator Bernie Sanders’ representative from making the trip. Senator Sanders’ staff member spoke briefly to the group and asked them to keep the senator’s office apprised of program activities. Also, another of Senator Sanders’ representatives had dropped by the Bennington Free Library during the spring of 2016 and had spoken at length with the librarian about the VELI-STEM project.

**Evaluation Reports** – To support project transparency, collaboration, course corrections and replication, the evaluator has been sharing and will continue to share statistical reports and other data-informed feedback with the full project team throughout the three-year project period, to equip the leadership team to disseminate key findings and insights via online and social media outlets.<sup>17</sup>

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<sup>17</sup> Also, see the discussions above on developing the VELI-STEM project’s on-line presence ([Objective 2](#) on the STEM Clearinghouse of Resources and [Objective 7](#) on social media).

Early in Year One of the project, the following evaluation reports were shared with the project leadership team, which may be posted on the [VELI-STEM website](#) and disseminated through other venues to promote the project and support replication:

- Analysis of Data on Participating VELI-STEM Libraries (March 2016)<sup>18</sup>
- Analysis of Librarian Baseline Self-Assessment Survey Data (March 2016)<sup>19</sup>
- Analysis of Librarian Post-Training Survey Data and Comments (May 2016)<sup>20</sup>

This Year One Evaluation Report will be shared with the full project leadership team, librarians and other stakeholders. Whenever possible, evaluation reports utilize a narrative and visual format and capture a variety of key perspectives, such as librarians, child care providers/early educators, children and families (presented anonymously through family member feedback), and leadership team members. The dissemination of the Year One Evaluation Report will provide an opportunity to share essential lessons learned with other libraries in Vermont and across the country that embark on STEM-infused library practices.

**Cultivating a Replication Mindset** – Perhaps of greatest value to achieving the project’s dissemination and promotion objective is the cultivation of a replication mindset throughout all facets of the project, including:

- Requiring librarians to track data and share insights on their experience of infusing STEM content throughout their library practices
- Using rigorous evaluation strategies to capture data and corroborating anecdotal information on the project’s progress, outcomes, challenges and successes
- Recording how the project leadership team conducts their administrative and fiscal oversight of the project.

For example, after the October 2016 librarian gathering, the project leadership team is reviewing the completed program templates that VELI-STEM librarians submitted to identify exemplars to further disseminate, because that type of concrete resource will be imperative for other librarians who wish to replicate the activities. The project team also will be sorting through and cataloging the numerous photos submitted by VELI-STEM librarians and these will be posted on the [VELI-STEM website](#) to help animate the textual and visual resources posted there. Also, project leadership is meticulously tracking the allocation and use of grant resources, not only for IMLS reporting purposes, but also to equip the team to be able to summarize the project’s funding model for the benefit of other individual libraries and regional and state library systems

*“VELI-STEM librarians seem to have a better understanding of their role as ‘initiators’ to the project and that other librarians are relying on what they’ve learned so they can do STEM programming at their own libraries.”*

VELI-STEM Project Leadership Team

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<sup>18</sup> See [Addendum A](#).

<sup>19</sup> Refer to the discussion of baseline and post-training survey findings under [Objective 8](#).

<sup>20</sup> Refer to the discussion of baseline and post-training survey findings under [Objective 8](#).

interested in implementing STEM-infused library practices. Toward this end, the Vermont Department of Libraries developed a time sheet/invoicing form\_for contractors to use to track expenses related to time and materials (template available upon request) and an [on-line form for librarians to track their time offered as cost share](#), which was streamlined in Fall 2016 and distributed to librarians at the October 2016 conference.

## **SUMMARY OF YEAR ONE EVALUATION FINDINGS**

At the end of three years, the key VELI-STEM project outcomes will be that a cohort of librarians from 25 rural and small libraries will have:

1. Received advanced STEM training, mentoring, learning tools (such as picture books), hands-on learning methods and materials and other STEM resources;
2. Been trained to recognize opportunities to incorporate STEM learning experiences for children and families throughout their library practice, including story hours, after-school programming, collection development, displays, “Discovery Science Centers,” newsletters and bibliographies;
3. Been given ample opportunity to access and contribute to an online STEM Clearinghouse of Resources developed throughout and after the project; and
4. Transferred their newly acquired STEM knowledge and skills to community childcare providers through outreach and training programs so that providers will, in turn, introduce STEM learning experiences to the young children in their care.

Already, tremendous progress has been made in achieving these project-end outcomes. Based on a careful analysis of the rich data and anecdotes generated through the evaluation of the VELI-STEM project in Year One, some particularly noteworthy areas of initial progress include:

- ❖ **Librarian recognition of STEM opportunities** – Librarians reported that they are now better able to recognize opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families throughout their library services and in community-based practices, based on an average librarian self-rating of 4.7 on a scale of 1-5 (with 1 being not at all proficient in recognizing opportunities and 5 being fully proficient) after the April 2016 training and as manifested by their observed and reported proficiency in incorporating STEM content throughout library programming in Year One.
- ❖ **Librarian use of STEM resources** – Librarians have made good use of the STEM trainings and materials they received, incorporating STEM content in innovative and diverse ways throughout their programming and in their interactions with children, parents and child care providers, as evidenced by high participation levels in STEM programming (over 3,700 total attendance of children, family members, child care providers and others among all libraries combined) and high levels of participant engagement (see below).
- ❖ **High levels of child and family engagement in STEM learning** – According to family member feedback (and corroborated by on-site observations):
  - 82% of 3-7-year-old children were reported as being “very” engaged in the STEM programs that the librarians provided, with 70% of the children reported as “very much” receiving a grounding in STEM knowledge and skills.
  - 73% of family members were “very” engaged in the STEM programs their child(ren) attended, with 78% of family members indicating that the STEM program made them feel “very much” able to encourage the child(ren)’s interest in STEM.
- ❖ **Librarian innovation in delivering STEM programs** – Librarians utilized a nice diversity of settings in the provision of STEM programming, trainings and outreach, with the most

frequently cited settings including library-based settings (86%), school-based settings (9.5%), broader community-based settings (4.5%, such as a tractor pull at a community park), and other settings (e.g., take-home kits).

- ❖ **Librarian transfer of STEM knowledge and skills to others** – Despite facing several challenges with this component of the project during the initial year, the group of librarians as a whole seemed to achieve considerable success in transferring their acquired STEM knowledge and skills to child care providers, with 89% of child care provider survey respondents indicating that the STEM training provided by their local librarian “very much” helped them to develop a better understanding of what STEM means to children ages 3-7 years old.<sup>21</sup> In turn, 100% of those child care provider survey respondents introduced STEM learning experiences to the 3-7-year-old children in their care.
- ❖ **Shared development, utilization and population of the STEM Clearinghouse** – The online [STEM Clearinghouse of Resources](#) was developed and used effectively in Year One, with librarians contributing ideas and activities. Librarians were introduced to the STEM Clearinghouse and other STEM content on the Weebly site at their April 2016 training and have been encouraged to visit the site regularly to find STEM activities that they can use in their own libraries. Also, librarians have been asked to complete [Program Templates](#) on their STEM activities so that the information can be posted on the VELI-STEM website to make program ideas widely accessible to other librarians. In addition, librarian feedback gathered at the April 2016 training was compiled and posted on the VELI-STEM Weebly website as “[Elements of a Good Program.](#)”
- ❖ **Librarian engagement of community STEM “resource people”** – While a number of librarians reported that they struggled during the project’s inaugural year with engaging key community stakeholders, a notable amount of STEM outreach among a wide range of types of stakeholders was conducted collectively by the librarians, such as engaging library trustees, town officials, local businesses and other key change agents. Over 570 stakeholders were engaged among the 22 libraries that submitted data, with a range of 4 to 157 stakeholders and an average of 25 stakeholders per library.

Looking ahead, a number of course corrections will be instituted to improve the efficacy of trainings and materials, to foster a more user-friendly evaluation process and to make more strategic use of librarian supports and resources. Already, the 25 participating libraries have begun infusing STEM content throughout their library practices to provide their community’s young children and families with opportunities to explore a wide range of STEM topics, practice inquiry, express their curiosity and experience the excitement of problem-solving and genuine discovery – in short, the VELI-STEM libraries are helping to create life-long learners, which will better position the State of Vermont to build the requisite intellectual capital to thrive in the 21<sup>st</sup> Century global economy.

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<sup>21</sup> As noted earlier in the report, only 18 child care providers completed a survey on the training they received and, among those respondents, only nine of the 25 libraries were represented.



**Vermont Early Literacy Initiative --  
Science, Technology, Engineering & Mathematics  
(VELI-STEM) Project  
Evaluation Report:  
Analysis of Data on Participating VELI-STEM Libraries  
March 2016**

**OVERVIEW:** The Vermont Department of Libraries (VDOL) and Vermont Center for the Book (VCB) selected 25 libraries to participate in the three-year VELI-STEM project, which is funded through a National Leadership Grant for Libraries from the Institute of Museum and Library Services. The 25 VELI-STEM libraries were selected based on six criteria, which the VDOL and VCB determined were critical indices of a library's potential and willingness to expand its capacity to provide early childhood STEM programming.

**FINDINGS:** Each of the six VELI-STEM library selection criteria is listed below with corresponding data on the sample of libraries.

SELECTION CRITERIA	DATA ON SAMPLE
Selection Criterion #1 -- Prior or current involvement in the Vermont Early Literacy Initiative	<ul style="list-style-type: none"> <li>➤ The Vermont Early Literacy Initiative (VELI) was developed in 2010 by the VCB and VDOL to support the development of early literacy skills and school readiness by providing training and resources to public librarians working with young children and their parents and caregivers. Given the common target population of the two programs, the 25 VELI-STEM libraries -- which represent approximately 50% of the over 50 libraries statewide that have participated in VELI -- will have opportunities to leverage certain skills and knowledge acquired through their VELI participation.</li> </ul>
Selection Criterion #2 -- Willingness and ability to participate in VELI-STEM	<ul style="list-style-type: none"> <li>➤ Three-year commitment letters were signed by all 25 libraries, attesting to the full endorsement of each library's director and trustees.</li> <li>➤ All 25 libraries have above average physical space to accommodate the requirements of library-based STEM programming. As a sample, the 25 VELI-STEM libraries have an average of over 6,920 square feet of space per library, whereas the average square footage per library for all state public libraries as a group is approximately 4,402.<sup>22</sup></li> <li>➤ The sample of 25 libraries is each open an average of 35.3 hours per week, whereas the state libraries as a whole are each open an average of 29.5 hours per week, indicating that the sampled libraries are more accessible<sup>23</sup>.</li> </ul>
Selection Criterion #3: Located in a rural setting	<ul style="list-style-type: none"> <li>➤ All Vermont public libraries meet the criteria for a rural designation except for Fletcher Free Library in Burlington, which is not participating in the VELI-STEM project.</li> </ul>

<sup>22</sup> Data obtained from the Vermont Libraries Fiscal Year 2014 report.

<sup>23</sup> Ibid.

	<ul style="list-style-type: none"> <li>➤ The average population served by each of the 25 VELI-STEM libraries is 5,643, and the average population served by each of the state libraries as a whole is 3,449<sup>24</sup>. The especially small rural libraries were not always as well positioned to participate in the project, thus skewing the average population served of the sampled libraries slightly upward from the overall state average.</li> </ul>
<b>Selection Criterion #4: Geographic mix of library locations</b>	<ul style="list-style-type: none"> <li>➤ By design, the 25 VELI-STEM libraries are disbursed geographically across the state to create the most representative sample possible.</li> <li>➤ The disbursement of sampled libraries (albeit, all within rural settings) led to a considerable level of diversity in the size of each library's population served, ranging from approximately 804 to 18,306 people<sup>25</sup>.</li> </ul>
<b>Selection Criterion #5: Variety in library staffing models</b>	<ul style="list-style-type: none"> <li>➤ For the sample of 25 VELI-STEM libraries, there is an average of 0.6 full time equivalents (FTE) holding an MLS from an ALA-accredited program, with an average of 0.5 FTE holding an MLS from an ALA-accredited program for the state libraries as a whole<sup>26</sup>.</li> <li>➤ The 25 sampled libraries have an average of 3.1 total FTE per library (with or without an MLS), while the state libraries as a whole each have an average of 2.1 total FTE<sup>27</sup>.</li> <li>➤ Some of the 25 VELI-STEM libraries are single-librarian libraries, while others have multiple library staff, with a range of 0.4-8.7 FTE<sup>28</sup>.</li> <li>➤ Each of the 25 sampled libraries have a librarian on site for an average of 78.1 hours/week with weekly hours of other staff averaging 46.7 (total average of 124.8 staff hours/week), whereas the state libraries as a whole each have a librarian on site for an average of 52.1 hours/week with weekly hours of other staff averaging 33.1 hours/week (total average of 85.4 staff hours/week).<sup>29</sup></li> </ul>
<b>Selection Criterion #6: Replicability of VELI-STEM in other libraries in Vermont and across the United States</b>	<ul style="list-style-type: none"> <li>➤ On average, the sample of 25 VELI-STEM libraries have higher values than all state libraries as a whole on a range of measures, including number of hours open, size of population served, FTE quantity and quality (MLS), size of physical space, and total capital revenue and operating income.</li> <li>➤ However, the resources of the 25 sampled libraries would still be considered modest, and the margin between the values for the two groups is not significant on a number of the measures. Therefore, the model being used in the VELI-STEM project should be replicable by a majority of similarly or more highly resourced Vermont public libraries, as well as by rural and smaller urban libraries of comparable resources around the country<sup>30</sup>.</li> </ul>

<sup>24</sup> Data obtained from the Vermont Libraries Fiscal Year 2014 report.

<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

<sup>30</sup> Ibid.



**VELI-STEM  
Conference, Year 1  
April 25 and 26, 2016  
Lake Morey Inn and Resort**

**Monday, April 25:**

- 8 - 8:30 am           Arrival and registration
- 9 am                    Welcome and introductions  
*Martha Reid, State Librarian, Vermont Department of Libraries*  
Overview, Goals of the Conference and Project  
*Sally Anderson, Executive Director, Vermont Center for the Book*
- 9:45 am                Inquiry-Based Explorations of Force and Motion  
*Karen Worth, Chair, Elementary Education Department, Wheelock College*  
*Greg DeFrancis, Program Director, Montshire Museum of Science*
- 12 noon                Lunch
- 12:45 pm               Introduction to VELI-STEM Clearinghouse of Resources  
*Wendy Martin, Associate Director, Vermont Center for the Book*  
*Mara Siegel, Continuing Ed. Coordinator, Vermont Department of Libraries*
- 1:15 pm                Small Group Explorations, Force and Motion
- 4:30 pm                Break
- 6 pm                    Dinner
- 7 pm                    Marble Runs Exploration

**Tuesday, April 26:**

- 7 am                    Breakfast buffet, downstairs dining room
- 8:30 am                Review of Small Group Explorations  
Introduction to Program Templates
- 10:30 am               Distribute Books and Materials  
Program Planning

ADDENDUM B: Agenda for the VELI-STEM Training Conference, Year One, April 25 and 26, 2016 –  
*continued*

**Tuesday, April 26 – *continued*:**

- 12 noon                      Lunch
- 12:45 pm                    Congressional Delegation and Promotion of the Project  
*Representatives (names to come)*  
*Tess Adone, Executive Assistant to the State Librarian*
- 1:45 pm                    Evaluation Requirements of the Project  
*Wendy Martin, Associate Director, Vermont Center for the Book*  
*Sharon Colvin, Youth Services Consultant, Vermont Department of*  
*Libraries*
- 3:30 pm                    Questions and Closure

## ADDENDUM C: VELI- STEM Year One Program Template

### **VELI-STEM Year One Program Template**

#### **Program Name:**

#### **Program Description:**

*This is a sentence or two about what you will do at the program.*

#### **Audience:**

*What type of program is it? Is it a story time? Family Night? Child-care training?*

#### **Step-by-step instructions:**

*How will you do the activity?*

#### **STEM connections:**

*How does this program incorporate STEM inquiry and content?*

#### **Prompts/questions:**

*How will you move along the investigation? What questions will you ask?*

#### **Materials and books:**

*What do you need? Which books will you use?*

#### **Take-home ideas:**

#### **Display ideas:**

#### **STEM Discovery Centers:**

#### **Community resources:**

#### **Promotion opportunities:**



**State of Vermont**  
**Department of Libraries**  
109 State Street  
Montpelier, VT 05609-0601

Tel: 802-828-3261  
Fax: 802-828-2199

*Agency of Administration*

**VELI-STEM COMMUNICATIONS PLAN**  
**April 26, 2016**

**Goal: promote the VELI-STEM project and the STEM learning experiences and project activities taking place in the 25 project libraries**

- Commenced with January 25, 2016 press conference
- Continues with the Department of Libraries coordinating statewide and national publicity and communicating findings of the project regularly to relevant media
- **Project librarians will promote VELI-STEM to their library boards, town officials, and throughout their local communities at organizations such as Rotary Club, businesses, non- profits, public schools, child care organizations, and other “people resources.” Project libraries will use press release templates to keep local media apprised of project activities on a regular basis. In addition, project librarians will be encouraged to present programs at state library meetings and conferences and to share their knowledge and experience with other libraries.**
- At the conclusion, the partners will publish and distribute a full final project report, including data from each library location and information on project outcomes.
  - **Schedule time** at every VELI-STEM planning meeting you hold in order to tend to the communications requirement of the grant, which will feed into your reporting requirements.
  - **Be consistent with recording information** for communications and reporting purposes:
    - Date/time spent of STEM programming
    - Event activities
    - New STEM materials
    - Numbers of children, families, child care providers, community members, Highlights of participation
    - Quotes, observations, anecdotes
    - Photos—with permissions from every participant photographed (see [release form](#))
    - Videos—with permissions from every participant in the video
  - **Use the VELI-STEM logo in all communications:**
    - JPEG files: [Color logo](#)      [Black & white logo](#)
  - **Re-design your weekly programming schedule** so that whenever a VELI-STEM event will take place, it stands out on the schedule. Post on your website, bulletin board, and in the local weekly newspaper listing.

ADDENDUM D: VELI-STEM Communications Plan – *continued*

- **With Department assistance, create a communications distribution list**
  - Identify editors, reporters, and writers who cover science, technology, engineering, math, features, education, early education, force and motion, and community calendar postings
  - Establish a format for full contact information for newspapers, radio stations, television stations
  - Use email to contact reporters and editors
- **Submit events for community calendars in every communications outlet available**
- **Write press releases, individually and in cooperation with the Department (see handouts)**
- **Add a VELI-STEM section to your website and newsletter**, and keep them up to date with information and articles on current, future, and past activities. **Blog** about activities.
- **Provide regular updates:**
  - Library board/trustees Town officials
  - State government representatives
  - Organizations:
    - Rotary Club
  - Businesses:
    - Posters
    - Nonprofits
    - People resources
  - Schools: STEM teachers, early learning teachers, PTO, after school groups Childcare organizations
- **Use social media:**
  - Facebook, Flickr, LinkedIn, Twitter, word of mouth to and from patrons and participants
- **Thank others often.** Goodwill is appreciated, especially when it's public.
- Advanced Communications: to be addressed in the future: Presentations, Interviews, IMLS [blog](#)

**[Contact Tess](#) for communications assistance, questions, and to further disseminate information on activities.**

Tess Adone, Executive Assistant to the State Librarian  
Vermont Department of Libraries  
109 State Street  
Montpelier, VT 05609-0601  
Tel: (802) 828-3266  
[tess.adone@vermont.gov](mailto:tess.adone@vermont.gov)  
Website: <http://libraries.vermont.gov>

### **VELI-STEM Communications Plan: Press Releases**

There are many sample press release templates available online; however, the [press release announcing the VELI-STEM grant](#) provides relevant information and language and serves as the foundation model for subsequent releases.

Note the *content elements* and *page layout*:

- Letterhead stationery
- Contact information with link to email
- Headline is title of event, bold and centered, with important key words to grab attention
- A sub-headline may be used
- VELI-STEM logo
- FOR IMMEDIATE RELEASE: Month 00, 2016
- *City, State* – precedes start of release
- Alternatively, if not using For Immediate Release, a dateline can be *City, State, Month 00, 2016*
- Who, what, when, where, why: essential information to promote the event, not provide an article
- Subsequent information decreases in importance
- Includes a pitch/variation on a quote with value and VIPS
- Formal language
- Links save explanations and space
- Formal titles consistently precede names; pecking order to list of names
- Special information: directions/map, parking, ADA accessibility
- IMLS logo and credit
- Fits comfortably on one page with 1” margins, single-spaced text, double-spaced paragraphs
- Times New Roman 12-point font

**VELI-STEM  
Program Template**

**Burnham Memorial Library, Colchester**

**Program Name:** What is a ball?

**Program Description:** *This is a sentence or two about what you will do at the program.* During this story time, we will investigate different types of balls, what makes a ball, and how balls move.

**Audience:** *What type of program is it? Is it a story time? Family Night? Child-care training? Story time.*

**Step-by-step instructions:** *How will you do the activity?*

1. Read *The Great Fuzz Frenzy*
2. Play the name game with a tennis ball then a ping pong ball (pass the ball to another person, say your name...). Stop ask for observations-what do you notice about the tennis ball? What do you notice about the ping pong ball? Then give everyone a bit of fuzz from the tennis ball for their own fuzz frenzy (we put ours on our heads). Can extend with the ABC song and try it with a plastic ball, a sock ball. Again, compare the balls- what do you notice about the plastic ball, the sock ball? List the attributes that the children and parents suggest.
3. Talk about what a ball looks like, then read *Maggie's Ball*
4. Show me what else is round like a ball? (lemon slice, watch, pizza topping, balloon). What else rolls like a ball?
5. Read *Oscar and the Cricket*. Roll tennis ball and stop, again try with different balls and ask what children notice.

**Activities:** *(can be stations, individual activities or choose some to do following stories)*

- A. Blow ping pong ball across table. Tape cup to side of table. Blow ping pong ball into cup.
- B. Use unsharpened pencils to play pencil ball trying to hit the ball into the cup (can have teams, 2 children at a time, or one child at a time and keep score by total number of balls into cups).
- C. Roll 2 balls, mark where each stopped, try a variety of balls. Tell me what you notice. If we try the same balls again, what do you think will happen?
- D. Make your own paper balls and play Herve Tullet's *Ball Game*.

Conclude with observations-what is a ball? How do balls move? What have we noticed about balls today?

**Extensions:** Using this experimentation and knowledge to further explore (what about a football?) and add ramps to the next program.

**STEM connections:** *How does this program incorporate STEM inquiry and content?*

This program incorporates exploration, inquiry, prediction, and repetition. Questions help the children think about both force and motion.

**Prompts/questions:** *How will you move along the investigation? What questions will you ask?*

What else could we do to move a ball? What would happen if we added a ramp? What do you notice about different kinds of balls? How can we tell what ball goes the furthest?

**Materials and books:** *What do you need? Which books will you use?*

A variety of balls; *The Great Fuzz Frenzy*; *Maggie's Ball*; *The Ball Game*; and *Oscar and Cricket*.

**Take-home ideas:**

Participants will take home their recording sheet (or booklet). Children can draw, write, or dictate their observations. Suggested home activities will be on the same page: explore with your child using a tennis or ping pong ball or any ball you have at home, provide materials for ramps (cookie sheets, boards, cardboard...). How far can you get the ball to go without touching the ground? Maybe add tubes from paper towels and masking tape to extend this activity.

**Display ideas:**

Photos of participants during program accompanied with text (what they said they discovered).

**STEM Discovery Centers:**

A corner or small table with balls and cardboard for ramps; Cars and ramps; Challenges- what else will travel down a ramp? Tubes and tape and matchbox cars. Cards with questions for adults to pose (1 or 2).

**Community resources:**

We shared materials with Milton Public Library. We have trained local child care and preschool teachers.

**Promotion opportunities:**

Child care and preschool training and outreach to centers.

Library promotions through our website and Facebook pages and monthly calendars.

## **Year One, April 2016 Training – Books and Hands-on Materials Distributed to Librarians**

### **Force and Motion**

#### Non-Fiction

*Motion: Push, Pull, Fast, Slow* by Darlene Stille. Explores the concepts of motion.

*Move It!* by Adrienne Mason. Facts and hands-on activities appropriate for ages 4-7.

*Roll, Slope and Slide* by Michael Dahl. A book about ramps.

*Worms, Whirlpools and Shadows* by Karen Worth. Identifies important science inquiry skills and concepts appropriate for the very young.

#### Fiction

*Newton and Me* by Lynne Mayer. A rhyming picture book that brings physics to preschool.

*Oscar and the Cricket* by Geoff Waring. A book about moving and rolling.

### **Inquiry**

#### Non-Fiction

*What is a Scientist?* by Barbara Lehn. Simple text and photographs depict children engaged in various activities that make up the scientific process.

#### Fiction

*Seven Blind Mice* by Ed Young. Illustrates the importance of making careful observations and collecting evidence to develop explanations.

*Up, Up in a Balloon* by Lawrence Lowery. Fiction stories about exploring with science practices.

### **Hands-on Materials:**

16 balls (4 each of 4 different kinds of balls)

12 cars

Wooden blocks

Storage container

Resource cards for families and child-care providers

#### **For families (15 sets per library):**

*Move It!*

*Oscar and the Cricket*

*What is a Scientist?*

Resource cards

#### **For child-care provider trainings (5 sets per lib.):**

*Move It!*

*Oscar and the Cricket*

Resource cards

## **Year One, Summer 2016 – Books and Hands-on Materials Distributed to Librarians**

### **STEM Inquiry**

Jocelyn, Marthe. *Hannah's Collections*. (multiple copies provided)

Swanson, Jennifer. *Explore Forces and Motion! With 25 Great Projects (Explore Your World)*.

### **Hands-on Materials:**

One set of 120 giant buttons, plus sorting loops (multiple sets provided)

### **Other resources:**

STEM inquiry resource card

Force and Motion resource card

(multiple sets provided)

## **Year One, October 2016 Training – Books and Hands-on Materials Distributed to Librarians**

### **STEM Inquiry**

Adler, David. *Circles*.

Bradley, Kimberly Brubaker. *Forces Make Things Move*.

Cobb, Vicki. *I Fall Down*.

Davis, Kathryn Gibbs Davis. *Mr. Ferris and His Wheel*.

Gibbons, Gail. *From Seed to Plant*.

Hirsch, Rebecca. *Plants Can't Sit Still*.

Lauber, Patricia. *Be Friends to Trees*.

McCarthy, Megan. *Pop! The Invention of Bubble Gum*.

Muldrow, Diane. *We Planted a Tree*.

Pfeffer, Wendy. *Wiggling Worms at Work*.

Price, April Jones. *What Do Wheels Do All Day?*

VCB et al. *Where Does My Shadow Sleep?*

Schwartz, David. *How Much is a Million?*

Shillady, Amy. *Spotlight on Young Children: Exploring Science*.

Sweeney, Joan. *Me and the Measure of Things*.

### **Hands-on Materials:**

Wooden unit blocks (Melissa & Doug)

10 hand lenses

measuring tape

## ADDENDUM G: Talking Points for Librarians on VELI-STEM

### **Why VELI-STEM?**

Vermont public libraries are busier than ever – with over 3 million visits in 2015, offering books, public WiFi and a wide variety of programs that foster personal enrichment and lifelong learning for all ages.

VELI-STEM will strengthen the ability of Vermont libraries to provide local opportunities for young children to explore and learn about science, technology, engineering and math. Not only is this important for their own personal understanding of the world around them, but this kind of informal learning fosters curiosity and the excitement of discovery.

Vermont librarians will develop and implement new library practices and programs that promote science inquiry and STEM learning for children, their parents, and childcare providers.

Once again, Vermont is taking the lead. This project is designed as a national model for small and rural libraries and the grant includes funds for training librarians who will visit Vermont from 22 other states. Library leaders across the country recognize Vermont public libraries for their innovations in early literacy, maker spaces, and other STEM- related programs.

### **Why Science for Young Children?**

The National Science Teachers Association (NSTA) affirms that learning science and engineering practices in the early years fosters children’s curiosity and enjoyment in exploring the world around them and lays the foundation for a progression of science learning in K–12 settings and throughout their entire lives.

We know that young children:

- have a natural fascination and wonder about the natural world in which they live
- have the capacity to engage in scientific practices and develop understanding at a conceptual level
- are active, self-motivated learners who learn best from personal experience rather than from decontextualized linguistic input
- develop science skills and knowledge in both formal and informal settings by engaging in experiential (hands-on) learning
- construct knowledge through participation with others in activities that foster experimentation, problem solving, and social interaction
- need multiple and varied opportunities to engage in science exploration and discovery

Adults play a central and important role in helping young children learn science. As young children participate in on-going science investigations they:

- Explore objects, materials, and events in new and different ways
- Learn and use vocabulary when they explore and talk together
- Cooperate and share while working with others
- Make models and drawings of what they’re doing
- Participate in focused discussion about what they observe
- Ask questions and solve problems: the more experiences they have, the more they can ask new questions

ADDENDUM H: Sample Individual Library Promotional Efforts  
(press release, local media coverage and posters on STEM programming)

**Brown Public Library 93 S Main Street Northfield, VT 05663**

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**For Immediate Release: June 2, 2016**

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**Contact:** Sarah Snow Youth Services Librarian  
**Phone:** (802) 485-4621  
**Email:** [Brownlibraryyouth@gmail.com](mailto:Brownlibraryyouth@gmail.com)  
**Website:** <http://www.brownpubliclibrary.org/veli-stem.html>  
**Date:** June 2, 2016



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**VELI-STEM “Worm Up” Storytime at The Brown Public Library**  
Have you ever wondered what worms are up to? Exploring science with today’s youth.

---

Northfield, VT Thursday, June 16th

The Brown Public Library was chosen by the Vermont Department of Libraries to participate in a National Leadership Grant for Libraries from the Institute of Museum and Library Services to inaugurate the Vermont Early Literacy Initiative in Science, Technology, Engineering and Math in partnership with the Vermont Center for the Book. As part of the VELI-STEM federal grant (<http://veli-stem.weebly.com>) the Brown Public Library is having a program to help youth explore measurement, science, and the technology of worms. Join us as we examine the force and motion it takes for worms to do their job. We will measure them, observe them and do a wormy craft together. Thursday, June 16<sup>th</sup> at 10am.

Youth Librarian, Sarah Snow and retired first grade teacher Hannah Morvan team up to teach local youth about the benefits of composting with worms. We will conduct experiments using worms (real ones, rubber and candy ones) read stories and sing songs about worms. In addition to learning about worms’ hands on, youth will sort beads which involves eye and hand coordination in order to make a worm to take home. Geared for children 3 to 7 years old but all ages are welcome.

This program is FREE and you do not need to register. At the close of our program, children will be asked to worm their way through our worm habitat obstacle course and we will offer a wormalishish snack.



This project was made possible in part by the Institute of Museum and Library Services (Leadership Grant LG80•15•0 012•15). The Institute of Museum and Library Services is the primary source of federal support for the nation’s 123,000 libraries and 35,000 museums. Its mission is to inspire libraries and museums to advance innovation, lifelong learning, and cultural and civic engagement. Its grant making, policy development, and research help libraries and museum s deliver valuable services that make it possible for communities and individuals to thrive.

To learn more, visit [www.imls.gov](http://www.imls.gov).

# Twenty-five libraries receive funding for early childhood program

**Librarians will be supported with training and materials for three years**

**By Makayla McGeeney**  
mcmgeeney@benningtonbanner.com  
@MC\_McGeeney on Twitter

**BENNINGTON** » The Bennington Free Library is among a group of 25 institutions in the state to receive funding for a new early childhood program.

The Vermont Department of Libraries acquired a National Leadership Grant for Libraries award valued at \$339,861 from the Institute of Museum and Library Services (IMLS) in order to launch the Vermont Early Literacy Initiative in Science, Technology, Engineering, and Math (VELI-STEM) in libraries throughout the state, according to a release from the state librarian executive assistant on Wednesday.

"I'm thrilled. We knew this was in the works and we knew we were up for the grant. Other librarians and myself wrote letters of support and its just important

to not only children's librarians but the kids and grown ups that we serve," Bennington Free Library Children's and Young Adult Librarian Linda Donigan said. "We've been participating in the Vermont early learning initiative and have received early literacy training, early math and science literacy training and training on emotional development, so it also reflects in our collection and what we do in the kids room."

In conjunction with the Vermont Center for the Book, VELI-STEM focuses on 3 to 7 year old children, parents, child care providers and community stakeholders. For three years, the grant will administer professional development training, books and other materials to librarians in hopes to establish a national model for other states' Departments of Libraries, the release stated.

Governor Peter Shumlin, State Librarian Martha Reid and Vermont Center for the Book Associate Director Wendy Martin will host a press conference regarding VELI-STEM on Jan. 26 at 10:30 a.m. in the Vermont State House Room 11.

Librarians at the Bennington location will start

training in April and will build on already developed skills as well as the language of STEM and core concepts.

"It's the perfect grant for our library because we have a very interactive space and we have been doing hands on science and math for many years and so this was a wonderful opportunity for us to continue to get training," Donigan said. "It's important not only for our children but good for children and parents to do math and science together."

— Makayla-Courtney McGeeney can be reached at (802)-447-7567, ext. 118.

Brown Public Library presents:  
VELI-STEM STORY TIME

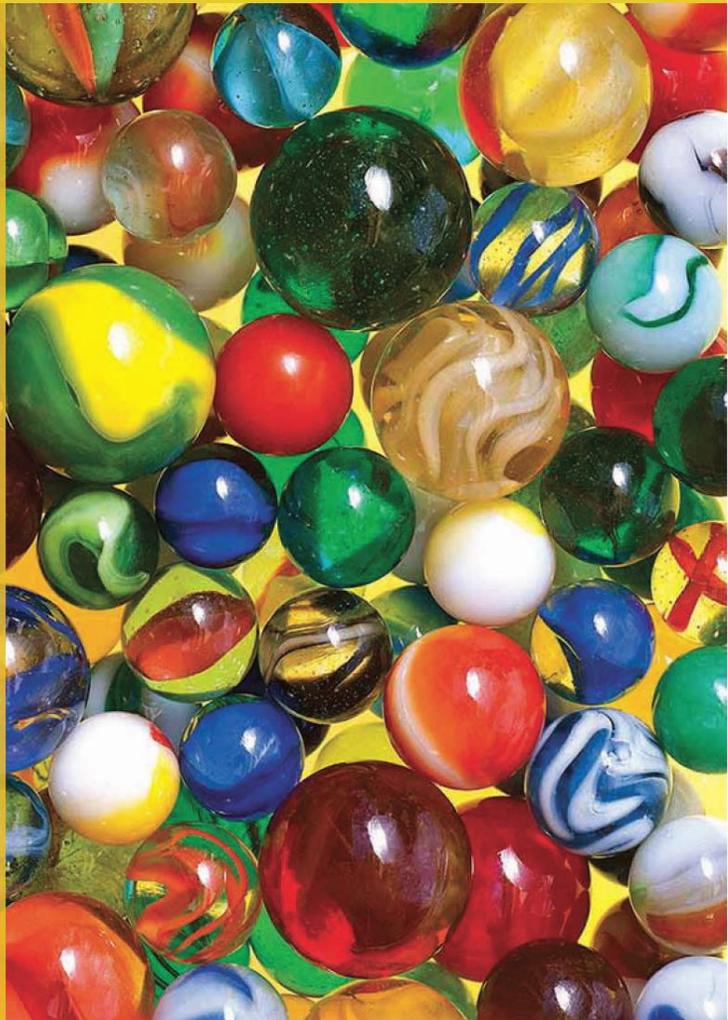
# FAMILY NIGHT MARBLE RUNS

Wednesday, June 29 • 6 p.m.

Join us to make  
marble runs out of  
recycled materials.  
We will provide all the  
materials, you provide  
the imagination.

We will award prizes  
for marble runs that  
are the fastest,  
the tallest and many  
more categories.  
Each family will  
receive free books.

Please register  
by calling  
1 (802) 485-4621



# ALL AGES WELCOME



Brown Public Library  
93 South Main Street  
Northfield, VT 05663



Brown Public Library presents:  
VELI-STEM STORY TIME

# FAMILY NIGHT MARBLE RUNS

Wednesday, June 29 • 6 p.m.



Join us to make marble runs out of recycled materials. We will provide all the materials, you provide the imagination.

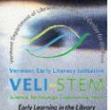


We will award prizes for marble runs that are the fastest, the tallest and many more categories. Each family will receive free books.



Please register by calling 485-4621

## ALL AGES WELCOME



Brown Public Library • 93 South Main Street • Northfield, VT 05663