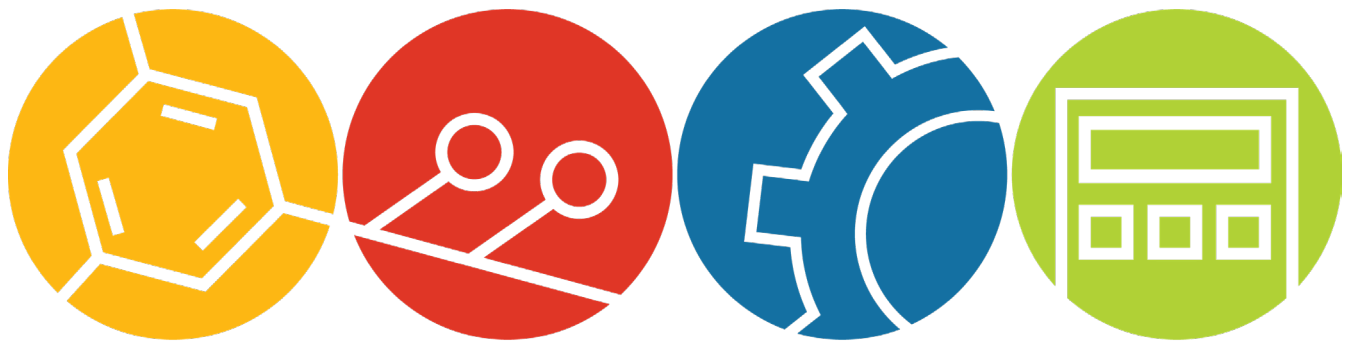
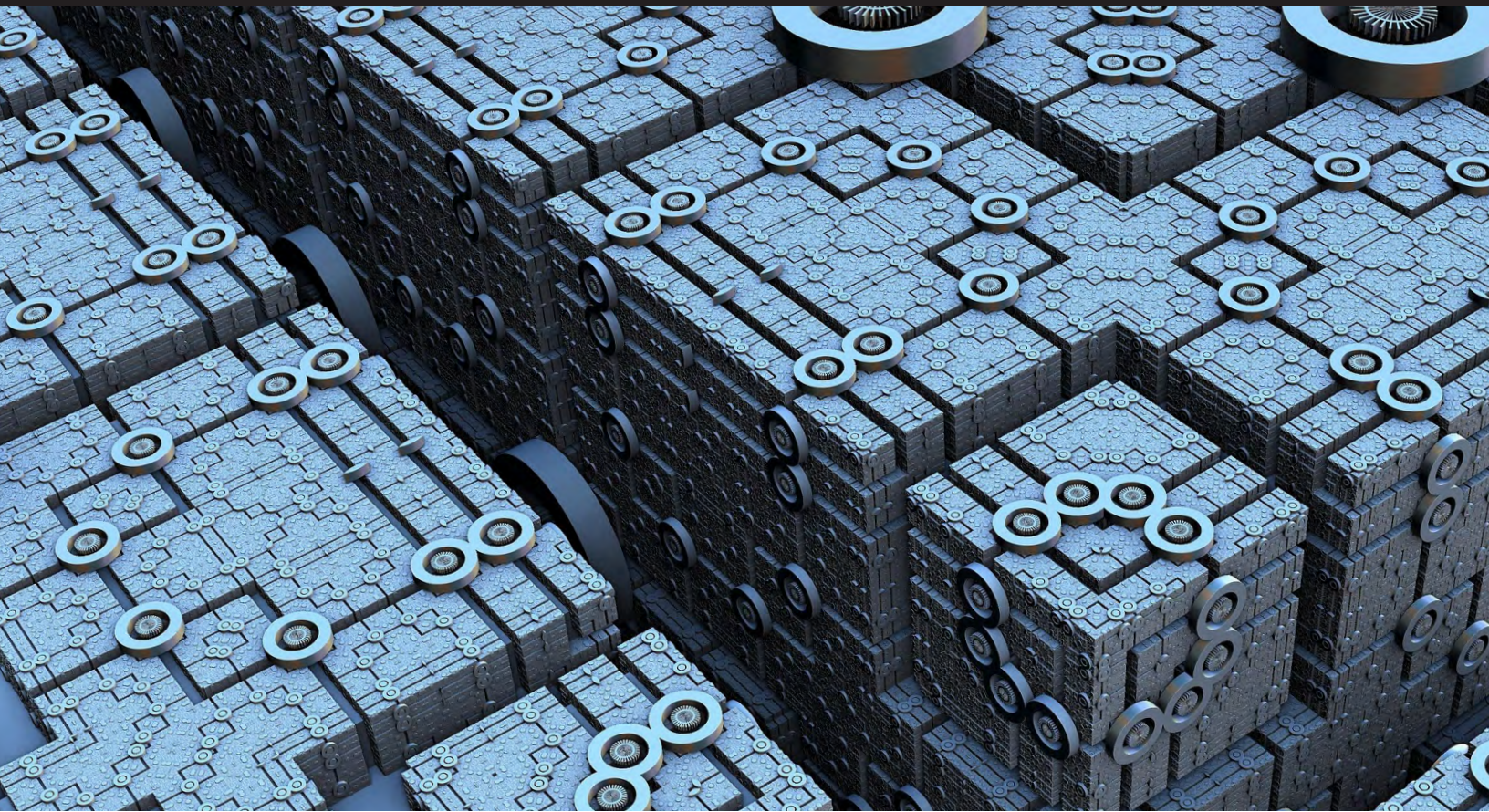


# STEM IN LIBRARIES | Logic Model Toolkit



# STEM **LIBRARIES**

The *STEM in Libraries* series of toolkits was published in 2018 by the Maine State Library and Cornerstones of Science. This project was made possible in part by the Institute of Museum and Library Services (grant number LG-80-15-0041-15) and the Silberstein Foundation.



The *STEM in Libraries: Logic Model Toolkit* provides resources to help you understand the purpose of logic models and the benefits of using them for program and evaluation planning.

You will learn to:

- Identify the key elements of logic models.
- Develop your own logic models for planning evaluations of your library's science, technology, engineering, and math (STEM) programs.
- Learn how you can use logic models to improve your STEM program and evaluation design.

#### What's inside:

- What is a logic model, and why use one?
- Developing your logic model
- Using your logic model
- Additional resources

## What is a logic model, and why use one?

As a supplement to the STEM in Libraries: Evaluation Toolkit, this toolkit will provide more information on how to create and use a logic model for planning evaluations of your science, technology, engineering, and math programs.

### What is a logic model?

Increasingly, program planners and evaluators are turning to logic models as tools for outlining the key elements of a program, building consensus on program design, identifying key outcomes, and determining what questions to ask and what to measure in program evaluations. In addition, many funders are requiring logic models as part of their grant applications. But the value of logic models goes well beyond just meeting a funding requirement. Logic models are essential tools for program and evaluation design.

What is a logic model? A logic model is a picture or a map of how your program works. It brings together in one place the basic elements of your program: whom you are planning to serve, the theory or assumptions underlying your program, key strategies, and expected outcomes. It helps you to see how the pieces of your program fit together and to determine the processes and outcomes to include in your program evaluation.



### What is a logic model?

A logic model is a picture of how your program works—what you will do, with whom, why, and with what result. Logic models are useful tools for program and evaluation design.

## Why use a logic model?

There are a number of reasons why it makes sense to develop a logic model for your program—and to continue to review and revise the model as your program develops.

- **Improved program design.** The process of creating a logic model helps clarify your thinking about the purpose of program, how it was intended to work, and what adaptations need to be made once the program is operational.
- **A starting point for management improvement and evaluation.** A logic model makes the program design explicit so you can decide more systematically what pieces of the program to study and what outcomes are important to track.
- **Understanding complex initiatives.** In complex programs or initiatives, a logic model can lay out interim outcomes, highlight assumptions, and make it easier to identify gaps in the thinking about how program activities might lead to hoped-for outcomes.
- **Team and partnership building.** The process of developing a logic model requires stakeholders to work together to clarify the rationale for the program and the conditions for success. The model becomes a focal point for discussion and a means of creating shared ownership and understanding among the stakeholders.
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## Developing your logic model

### Key elements of a logic model

Logic models can take many forms, and if you search online, you'll find hundreds of guides on how to build different kinds of logic models. (See the Additional Resources section of this toolkit for a few suggested guides.) But let's keep it simple. Typically, a logic model asks you to think about a set of key program elements:

- What is the **problem** to be addressed or **goal** to be achieved?
- **Whom** will the program serve?
- What are your **assumptions** about how and why your program will work?
- What **strategies** and **activities** will you use?
- What **outputs** and **outcomes** do you expect?
- What long-term **impacts** do you hope to achieve?

#### Your logic model should support your “theory of change.”

This is your belief that, “If we do X, then Y should happen, if the assumptions on which the program is based are true.”

**Example:** If our library engages community members in STEM activities related to issues directly affecting the community, then we can increase local STEM interest and begin to build an identity for the library as a resource for STEM learning.

Your logic model should support your “theory of change”—your belief that “If we do X, then Y should happen.” If your assumptions about the program are correct and you carry out certain activities, then certain outputs, outcomes, and impacts will follow.

The Sample Logic Model Elements table provides an example of a simple format for a logic model. While there can be many variations—some models have an “inputs” column instead of asking “whom” is being served; others include a column on how to measure success—this table can give you a good starting point. There's no single “right” format. You can use this model, modify it, or find another version that works for you. Another sample logic model template is available at [www.stemlibraries.org](http://www.stemlibraries.org) in the Public Library STEM Guide.

## **Building your logic model**

Many program leaders will sit down and try to develop a logic model on their own. This can be a mistake, because much of the value of creating a logic model comes from the discussion and exchange that occurs during the process, as team members share their understanding of a program. Consequently, it is usually best to develop your logic model with the key stakeholders for your program and/or your evaluation as a way of building a common understanding and buy-in for the program or evaluation design.

Different teams develop their logic models in different ways. Some groups like to start with the goal or problem statement and then work across the model from left to right—talking about whom they are serving, assumptions, strategies and activities, and outputs and outcomes, in that order. Others like to work back and forth—first talking about whom they are serving, then jumping to the desired outcomes, then working back toward needed services and the assumptions underlying their approach. Once again, there is no one “right” way to do this. What is important is to take on the challenge in a way that works for you and your team.



**Statement of problem or goal:** What is the problem to be addressed or goal to be achieved?

**Example:** Increase the STEM literacy of community residents through enhanced programming at the library.

Who	Assumptions	Strategies and activities	Outputs	Outcomes
Whom will the program serve?	What are your assumptions about how and why your program will work?	What will you do? What strategies and activities will you use to accomplish your goal?	What will be the product of this program? What will you count when you measure output?	What short-term changes do you expect to result from this project?
List key stakeholders or target groups.	Describe what you know, think, and believe about what's needed and what will work.	Describe what you plan to do to achieve your desired outcomes.	List what you expect to produce through the program (materials, participants, activity counts, etc.).	Identify reasonably measurable changes in policies, practices, or target group(s).
<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>◦ Preschool children</li> <li>◦ Elementary school children</li> <li>◦ Teens</li> <li>◦ Adults</li> <li>◦ Senior residents</li> <li>◦ ESL populations</li> </ul>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>◦ Regular engagement in STEM-related activities will help increase STEM interest and literacy.</li> <li>◦ Patrons are best engaged through STEM topics related to everyday life and the community.</li> <li>◦ Increased STEM programming will help position the library as a STEM resource in the community.</li> <li>◦ Staff capacity building on STEM is needed to support new programming.</li> </ul>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>◦ Monthly presentation and book discussion on science behind local issues</li> <li>◦ Children's STEM activities and story times</li> <li>◦ Creation of new STEM-focused library resources (loanable STEM items, maker-spaces, etc.)</li> <li>◦ Creation of "lead" STEM position or STEM working group</li> <li>◦ Staff development program to increase familiarity of staff with library's STEM resources</li> </ul>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>◦ During year 1,</li> <li>◦ 10 to 12 interactive STEM presentations with 15+ participants per session</li> <li>◦ STEM story times or children's activities at least once a week</li> <li>◦ Monthly orientations or workshops on use of makerspace tools</li> <li>◦ Monthly STEM updates at staff meetings and four half-day staff development workshops (run by library STEM "lead")</li> <li>◦ Overall total of XXX participants in STEM-related activities</li> </ul>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>◦ X% of program participants report increased interest in session topic.</li> <li>◦ X% of participants report increased interest in STEM generally.</li> <li>◦ X% of participants view library as STEM resource for community.</li> <li>◦ X% of library staff report increased interest in providing STEM programming.</li> <li>◦ X% of staff report increased confidence in developing new STEM programming.</li> <li>◦ Circulation of STEM resources increased X% year-over-year.</li> </ul>



## Using your logic model

### Assessing your draft logic model

When your draft is done, you should have a complete picture of your program, and the elements of your logic model should fit together. For example, there should be a clear relationship between the outcomes you hope to achieve and the services or activities you have outlined. If you have included an outcome but there is no clear strategy leading to that outcome, your logic model (and your program) is likely missing an important piece.

If you are using your logic model as a tool for program planning, there are a number of questions you should ask once your draft model is done. The following questions are adapted from “Introducing Program Teams to Logic Models,” by Porteous, Sheldrick, and Stewart (see the Additional Resources section of this toolkit for details):

- Is it reasonable to expect that the initiative’s planned strategies will lead to the expected outcomes?
- Are all the outcomes supported by strategies?
- Are all relevant target groups, strategies, and outcomes included?
- Are there sufficient resources to undertake the activities?
- Do all the components lead to one or more of the outcomes?
- Are the outcomes really outcomes, not activities?
- Are the outcomes reasonably measurable?
- Are all stakeholders in agreement about the logic model?

The answers to these questions will help you determine which pieces of the logic model you need to continue to refine.

### Using your logic model to guide program evaluation

Once completed, your logic model can serve as a map or guide for your evaluation efforts. The elements of your logic model can highlight questions you might ask during your evaluation planning process—and as your program progresses. For example:

**Is your program actually serving the populations you targeted?** You may want to collect demographic information from participants to demonstrate that you are serving your target population.

**What aspects of program implementation do you want to measure?** Look at the Activities and Strategies column in your logic model. Are these taking place as expected, or are there variations in how the program is being implemented? Are the expected activities taking place at the expected level and producing the planned outputs? For example, are programs taking place as frequently as planned? Is attendance meeting expectations? Are practices considered essential to program quality being implemented?

Your list of expected outcomes can help focus your discussion on which outcomes you want to measure and how. You may need to make choices about what to measure; some things are easier to assess than others, and we often want to know more than we can reasonably determine with assessments. By having the outcomes listed in one place, your evaluation team can talk about which are the highest priority outcomes to include in the evaluation.

Your assumptions can also point to additional questions you may want to ask. Are your assumptions correct about what is important in the program? As part of your evaluation, you may want to ask participants or staff about what they think is making the program work.

In short, as you begin to think about the questions you want to answer and the data you want to collect, your logic model can help inform your work.

## **Making your logic model a living document**

Here are the key points to remember as you develop and use your logic model:

- Involve a variety of stakeholders.
- Focus on being outcome driven, not activity driven.
- Check logical connections across categories.
- Use the logic model to develop more detailed action plans.
- Revisit and revise your logic model periodically.
- It will get easier!

Keep in mind that your logic model isn't something you create once and then set aside. Think of it as a living document that will evolve and improve, along with your program, over time.

## Additional resources

[\*\*\*A Guide for Developing Logic Models Through a Program Theory of Change\*\*\*](#), from the Milwaukee Public Schools Research and Development office, offers an introduction to constructing logic models with an emphasis on incorporating your theory of change.

[\*\*“How to Develop a Program Logic Model”\*\*](#) (undated) is a slide presentation from a webinar by the Corporation for National & Community Service.

[\*\*“Introducing Program Teams to Logic Models: Facilitating the Learning Process,”\*\*](#) by NL Porteous, BJ Sheldrick, and PJ Stewart (2002). *The Canadian Journal of Program Evaluation*, 17(3), 113–141.

The [\*\*STEM in Libraries: Evaluation Toolkit\*\*](#) shows how logic models fit into the bigger picture of program evaluation.

[\*\*WK Kellogg Foundation Logic Model Development Guide\*\*](#) (2006) is a detailed how-to guide to logic modeling for nonprofits and community organizations.









