

STEM Afterschool: It's Time to Activate!

A messaging toolkit
to make the case for
STEM in afterschool

Developed by the Frameworks Institute in
partnership with the Afterschool STEM Hub



AFTERSCHOOL
STEM HUB

Welcome to the resource center for the Afterschool STEM Hub.

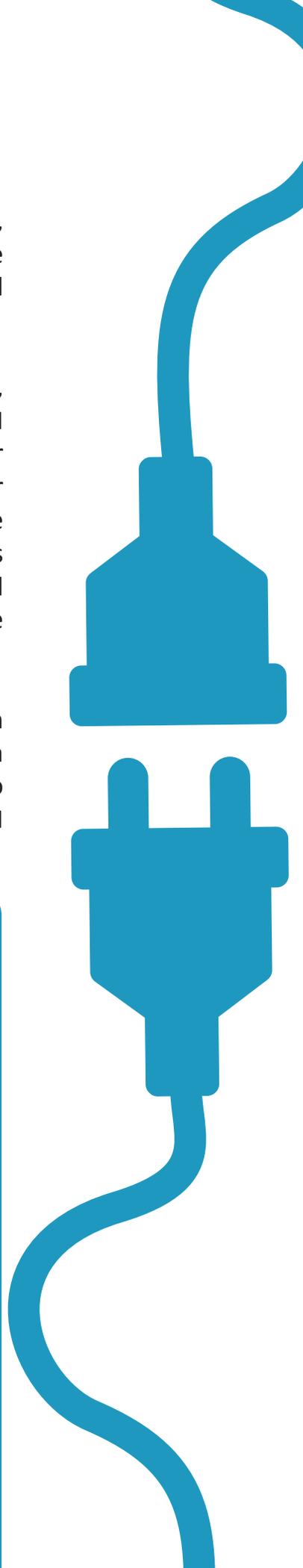
Here, advocates for high-quality afterschool programming in science, technology, engineering and math (STEM) will find useful tools to make the case for expanding and supporting innovative and engaging informal STEM learning.

Even though everyday life surrounds us with obvious STEM applications, it can still be challenging to make the case for meaningful reforms in STEM learning. It's harder still when it comes to afterschool settings. Whether you're talking with a policy maker, a funder, or potential community or school partners, there are common framing strategies that can help make a powerful argument for why afterschool STEM matters. The themes represented in the talking points and other advocacy materials are based on careful communications research—so advocates can have confidence that they are reliable, tested ways of positioning afterschool STEM.

By using these materials, your local advocacy efforts will harmonize with the efforts of afterschool STEM advocates across the nation. Speaking a common language, we can amplify our voices, assure greater attention to these issues, and expand children's access to effective afterschool STEM learning.

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Talking Points

SHARED PROSPERITY. The interconnected content areas of science, technology, engineering and math (STEM) give us the building blocks for understanding and improving the systems that power our economy and advance our society.

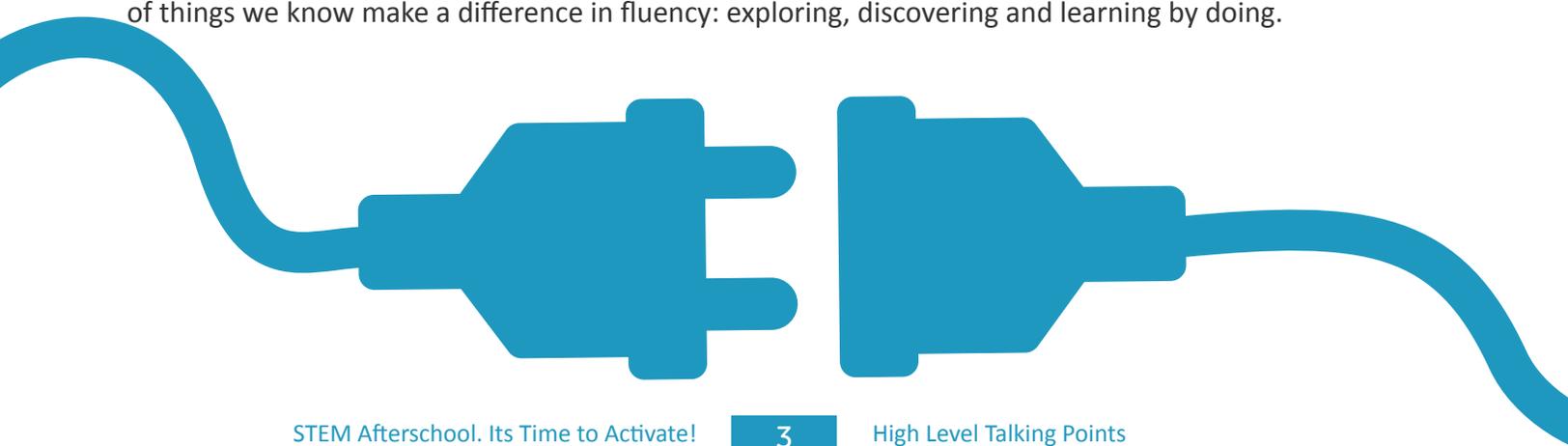
FUTURE PREPARATION. Given our complex and changing world, we need tomorrow’s citizens to be equipped to meet our modern challenges. Learning in science, technology, engineering and math—the subjects called “STEM”—builds the knowledge and skills needed to reason through tough problems and come up with creative, effective, and reasonable solutions.

ACTIVATION. Afterschool programs activate learning in science, technology, engineering and math—the subjects called “STEM.” Afternoon, weekend and summer programs spark learning by letting children and youth experiment with STEM ideas in real-world situations, explore ideas through hands-on activities, and choose experiences that connect to their interests or culture. Such opportunities help ignite curiosity, especially for those who might not think of themselves as “math and science kids.”

FLUENCY. Afterschool learning helps children and youth become more fluent in science, technology, engineering and math—the subjects called “STEM.” Just as people need to be immersed in real-world situations to really learn a language, children and youth need multiple and varied opportunities to explore and tinker with STEM concepts to fully understand and become fluent in these subjects. By working through interesting and practical challenges with STEM methods, tools or ways of thinking, kids develop a better command of these subjects and can do more with them.

RIGHT NOW, SOME COMMUNITIES DON’T HAVE ACCESS TO ENOUGH STRONG STEM OPPORTUNITIES. The quality and variety of STEM opportunities can be pretty uneven from place to place. To keep building our shared prosperity, we need to ensure that all children, regardless of where they live, have chances to build the skills and knowledge that the world of tomorrow will demand.

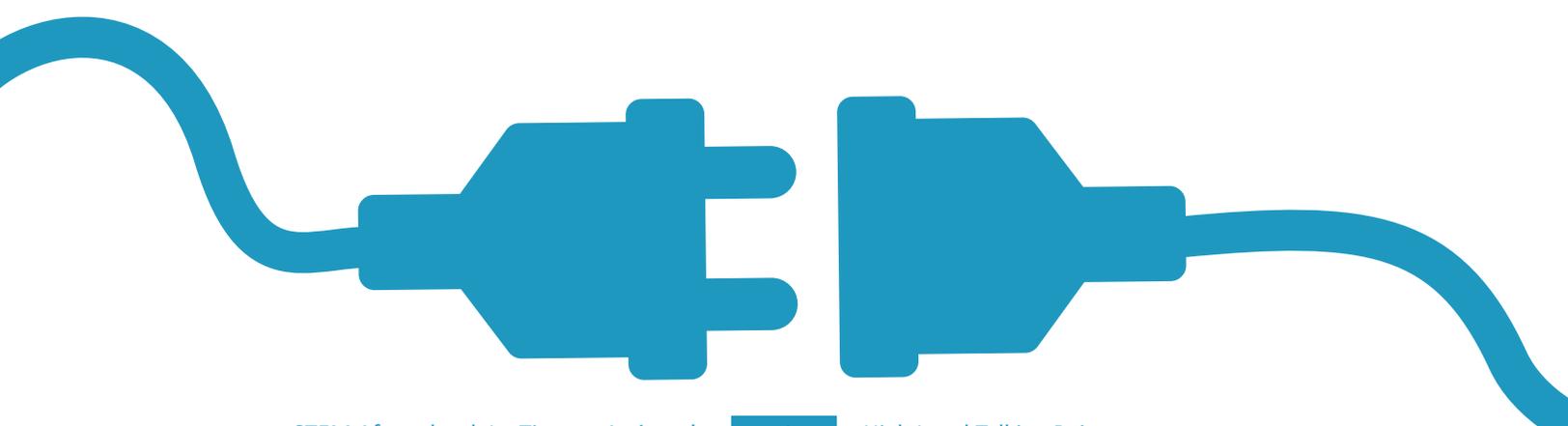
LET’S USE AFTERSCHOOL TIME TO IMMERSIVE STUDENTS IN STEM. If we want the next generation to be fluent in STEM, we have to take an immersion approach. Children of school age spend only 20 percent of their waking hours in school—the other 80 percent is spent outside of school. To allow for the level of exposure and experiences needed to develop fluency in STEM, we must ensure that all communities offer ways for students to engage with these subjects afterschool. And this time must be spent doing the kinds of things we know make a difference in fluency: exploring, discovering and learning by doing.



LET'S USE AFTERSCHOOL TIME TO IGNITE YOUNG PEOPLE'S INTERESTS. Because afterschool and summer programs have great flexibility and can vary the modes of learning, they can help ignite students' curiosity and interest in these vital areas. The more students participate in STEM opportunities afterschool, the more interested they become in these important subjects. And because afterschool STEM programs are ideal places to let students identify, plan and lead their own projects, they build skills that apply across many situations.

LET'S MAKE SURE EVERY CHILD, REGARDLESS OF ZIP CODE, CAN BE CONNECTED TO POWERFUL STEM "CHARGING STATIONS." Opportunities to learn are like charging stations where kids power up their ability to take an active role in learning. But not all communities have equal access to STEM resources. For example, some areas have many technology companies or engineering firms that can partner with afterschool programs, while others have few or none. This uneven, patchy network of STEM charging stations is hindering our progress toward widespread STEM fluency. To fix this, we need to fill in the missing connections, plugging in all regions to STEM learning.

TO GET READY FOR A STEM-DRIVEN FUTURE, WE HAVE TO FIND WAYS OF IMMERSING—AND INCLUDING—ALL YOUNG PEOPLE IN RICH STEM LEARNING. Traditionally, there have been fewer young women and fewer young people of color who pursue STEM majors in college or go on to STEM professions. To build and maintain our nation's shared prosperity, we need to expand our pool of STEM talent and we can't afford to leave anyone out. Because afterschool programs have the flexibility to respond to young people's interests and cultures, and because hands-on, exploratory experiences are known to be effective ways to turn young people on to new interests, afterschool STEM is an essential resource for including groups of kids who might not consider these fields otherwise. By expanding afterschool STEM, we can engage more girls, more African Americans, and more Hispanic youth in these critical, growing areas. Immersing and including all students in STEM learning leaves us all better off in the long run.



Talking Points PLUS

SUPPORTING FACTS AND EXAMPLES

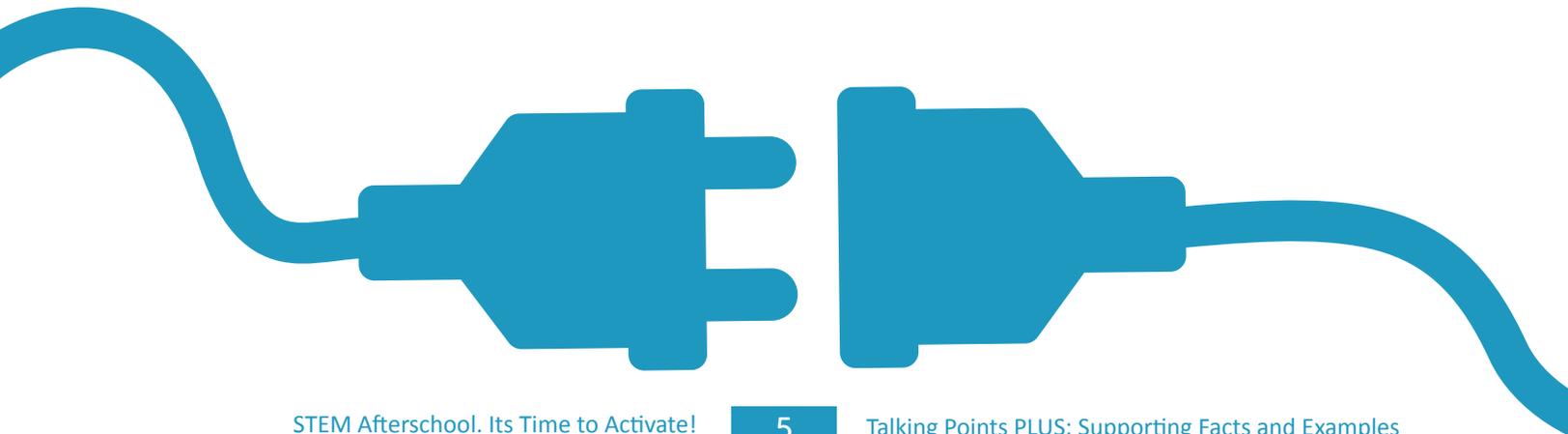
WHY DOES THIS MATTER TO SOCIETY?

SHARED PROSPERITY. The interconnected content areas of science, technology, engineering and math give us the building blocks for understanding and improving the systems that power our economy and advance our society.

- Supporting Data Point: The primary driver of the future economy, and especially job creation, will be innovation, largely from advances in science and engineering. By adding to the sector that develops new products and services, we add to the pool of people creating jobs for our economy. In fact, one job in the high-tech sector leads to four new jobs in local goods and service industries. [Sources: <http://documents.bayareacouncil.org/TechReport.pdf> via *Change the Equation*]
- We're experiencing a rapid growth in the need for STEM professionals. Between 2008 and 2018, the nation's need for STEM professionals will grow by 17 percent—which is more than the projected growth for administrative work, sales and transportation combined. [Source: *Bureau of Labor Statistics.*]

FUTURE PREPARATION. Given our complex and changing world, we will need citizens who are critical thinkers and problem-solvers to meet our modern challenges. Learning in science, technology, engineering and math—the subjects called “STEM”—builds the knowledge and skills needed to tackle problems systematically. STEM helps to build the ability to sift through information, draw reasonable conclusions, make decisions based on evidence, and come up with creative solutions.

- Supporting Data Point: STEM subjects cultivate experience with experimenting and checking assumptions against evidence, which helps make everyone a better problem-solver. Additionally, STEM learning hones relevant, real-life observation and analysis skills for young people. The kinds of projects that kids tackle in afterschool STEM programs also help them build teamwork and communication skills. These are the kinds of skills that our fast-changing modern society needs. A study of afterschool STEM program evaluations from across the country showed that these kinds of skills are being built in strong afterschool STEM programs. [Source: <http://afterschoolalliance.org/ExaminingtheImpactofAfterschoolSTEMPrograms.pdf>]



HOW DOES THIS WORK?

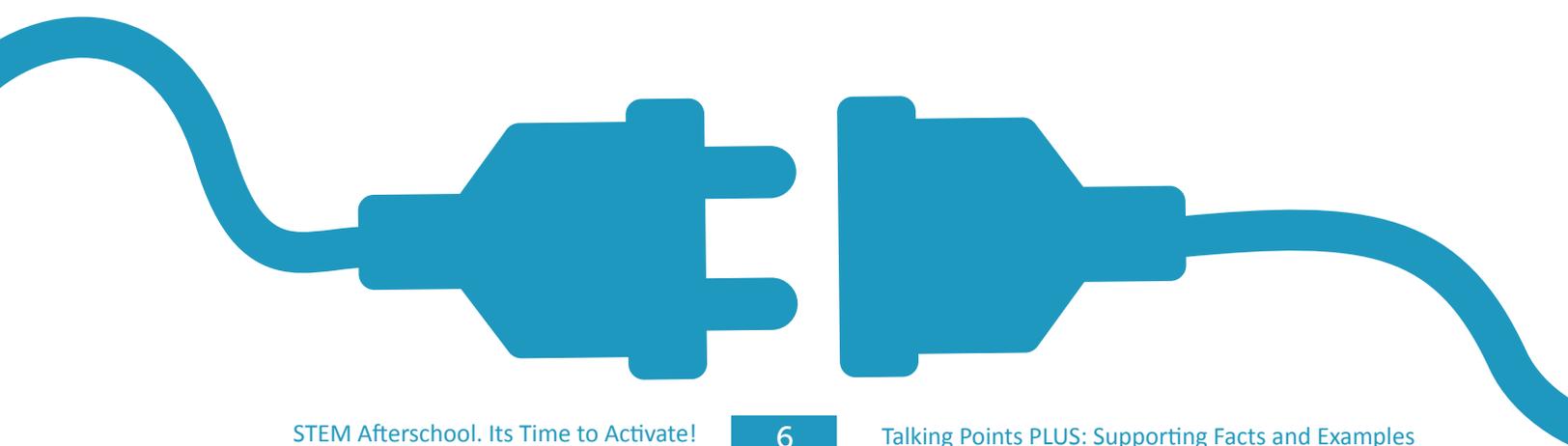
ACTIVATION. Afterschool programs activate learning in science, technology, engineering and math—what is called “STEM.” Afterschool and summer programs spark learning by letting children and youth experiment with STEM ideas in real-world situations. Such opportunities help spark curiosity, especially for those who might not think of themselves as “math and science kids.”

Supporting Data Points to Choose From:

- Seventy-five percent of Nobel Prize winners in the sciences report that their passion for science was first sparked in non-school environments (Friedman & Quinn, 2006).
- The more students participate in STEM opportunities after school, the more interested they become in these important subjects (Wai et al 2010).
- Participating in afterschool STEM programs can keep the spark of interest in STEM alive during the middle school years, when otherwise, the interest students showed earlier tends to fade out (Bevan et al 2012; Staus, 2015).

FLUENCY. Afterschool learning helps children and youth become fluent in science, technology, engineering and math—the subjects called “STEM.” Just as people need to be immersed in real-world situations to learn a language, children and youth need to explore STEM in their lives outside of the classroom to fully understand and become fluent in these subjects. By working through interesting and practical challenges with STEM methods, tools, or ways of thinking, kids develop a better command of these subjects and can do more with them.

- Supporting Data Point: Just like language learners benefit from experiencing lots of different real world situations to become conversationally fluent, STEM learners benefit greatly from regular opportunities to develop their skills. A recent study compared 4th-graders who were involved almost daily in hands-on science, both in and after school, with those who only got a chance to participate once or twice a month. The results aren’t surprising: the students who were immersed in science had more advanced fluency than those with fewer opportunities. (Wai et al 2010).
- Explanatory Example: Here’s an example of how afterschool programs allow for the kinds of immersion that build fluency. In a program in New Mexico, middle schoolers from all kinds of backgrounds, including children from rural areas, actively experiment with a computer programming language to create and test models of complex systems, such as the environment, or outbreaks of diseases. These models are then used to run simulations of “what if” scenarios to answer questions about real-world concerns, with local examples to make the learning come to life.



For example, as part of a unit on epidemiology, students develop models to test if a disease would spread throughout their local school population given the layout of the school building, the number of students, the movement of the students, the virulence of the disease, and the number of students initially infected. In addition to learning and practicing thinking skills that are important in many subjects, such as testing hypotheses and thinking abstractly, they also develop specific programming skills, such as creating scripts that perform certain tasks automatically.

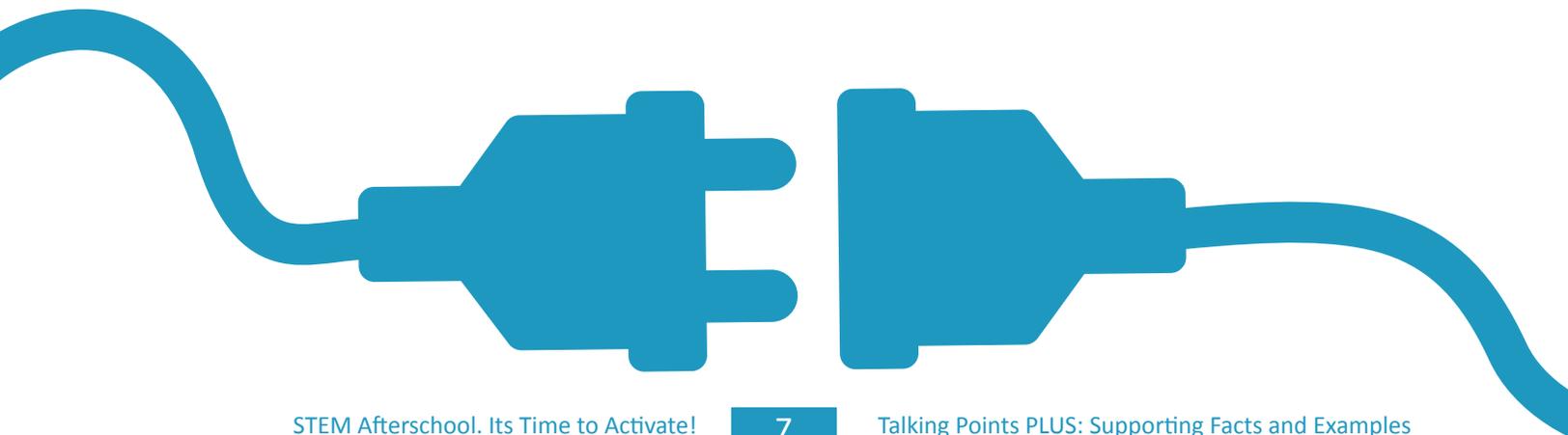
The students leave with a new set of skills for tackling social problems from health to ecology—when asked how they would investigate a community problem, 80 percent suggested using computer modeling and simulation as a technique to investigate the issue. This is a great example of how the need to solve real-world problems builds new skills and a greater ability to use concepts—just like having to get around in a new country helps to develop fluency in a language.

WHAT'S GETTING IN THE WAY OF EFFECTIVE INFORMAL STEM LEARNING NOW?

IN MOST CASES, WE'RE NOT TAKING AN IMMERSION APPROACH. To build fluency in a language, you need to use it often and in lots of different ways. The same applies to building fluency in STEM—it's not enough to do a little here and there. Multiple, connected experiences are important. Right now, in most cases, we're not taking an immersion approach to STEM learning. This should change.

Supporting Data Points to Choose From:

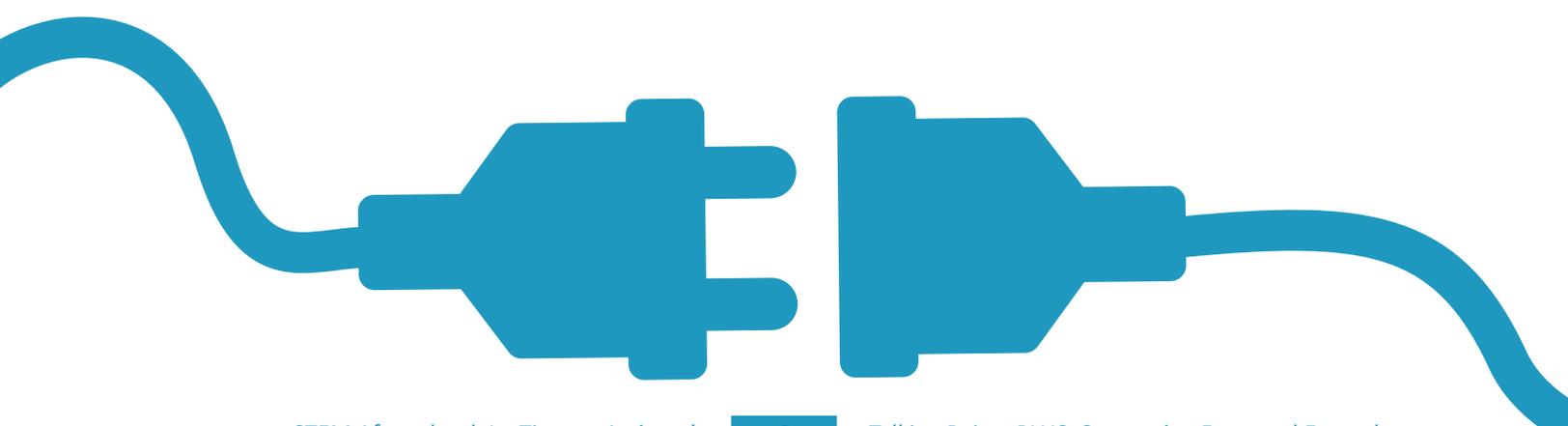
- There simply aren't enough afterschool opportunities for students to immerse themselves in, whether in STEM or in any other area of learning. We need to expand afterschool programming. Right now, existing afterschool programming is only meeting about one third of the need nationwide. That means for every child in an afterschool program, there are two more waiting to get in.
- An in-depth study of afterschool STEM programs in California showed that while the majority of sites reviewed did offer something related to STEM, typically, it was happening less than once a week. Moreover, sites tended to plan out just one session at a time, instead of connecting one experience to the next. This once-in-a-while, one-shot approach doesn't work very well—so we need to support the kinds of afterschool and summer programming that lets learners go deeper—connect ideas to each other, conduct experiments, build models, and so forth. (Source: <http://afterschoolsciencestudy.sri.com/downloads/asn-findings.pdf>)



RIGHT NOW, SOME COMMUNITIES DON'T HAVE ACCESS TO ENOUGH STRONG STEM OPPORTUNITIES—THERE'S A LACK OF FAIRNESS ACROSS PLACES. Some communities are filled with opportunities for STEM learning: great libraries and museums, vibrant community gardens, science centers, and a variety of engaging, hands-on afterschool programs. Other communities have fewer opportunities like these, or have other challenges—such as a lack of public transportation—that make them harder for learners to access. If we want shared prosperity across the nation, we need to ensure that all children, regardless of where they live, have lots of chances to be exposed to STEM learning out of school. To create greater fairness across places, we need to devote more resources to areas that have fewer high-quality, accessible opportunities.

Supporting Data Points to Choose From:

- The U.S. Chamber of Commerce Foundation recently conducted an analysis of nationwide student preparation in STEM, and found wide variation across the states. In Massachusetts, the highest-scoring state, one in six students complete and earn at least one advanced high school STEM credit. In Mississippi, the lowest-ranking state, the rate is one in 80 students. (Source: <http://www.leadersandlaggards.org/sites/default/files/Leaders%20and%20Laggards%20A%20State-by-State%20Report%20Card%20on%20K-12%20Educational%20Effectiveness.pdf>)
- If we look state by state, we can see that afterschool opportunities aren't distributed equally from place to place. Some states fund afterschool programs; others don't. Some have initiatives in place that promote quality afterschool; others don't. A few have moved ahead and passed legislation that directly supports afterschool programs; students in most states aren't so lucky.
- A large study conducted by Nielsen showed that nationally, we are failing to provide afterschool STEM learning in rural areas. Children who live way out in the country, or even just in small towns, are participating in afterschool STEM at about half the rate of urban kids. And by providing fewer opportunities to explore STEM in the afternoon, on the weekends, or in the summer, we are also missing opportunities to make up for the weaker STEM resources in their schools. Rural areas are less likely than America as a whole to offer access to challenging math and science classes, qualified math and science teachers, role models in STEM fields, or community resources such as science museums. (Source: <http://changetheequation.org/sites/default/files/CTEq%20Vital%20Signs%20Lost%20Opportunity.pdf>)



HOW CAN WE IMPROVE STEM LEARNING?

LET'S USE OUT OF SCHOOL TIME TO IMMERGE STUDENTS IN STEM. If we want the next generation to be fluent in STEM, we have to take an immersion approach. Just like language learners benefit from being immersed in real world situations to become conversationally fluent, STEM learners benefit greatly from opportunities to practice hands-on application to develop their skills in science, technology, engineering and math.

- Children of school age spend only 20 percent of their waking hours in school—the other 80 percent is spent outside of school. Children can discover their passions and pick up new skills as they explore their world in those afterschool hours. To allow for the level of exposure and experiences needed to develop fluency in STEM, we must ensure that all communities offer ways for students to engage with these subjects in multiple and varied ways, in different places and spaces. Taking steps now to ensure that all communities have access to STEM learning resources like afterschool programs, museums, zoos and aquariums, and science centers will increase the opportunities for kids to get immersed in these important subjects. And this afterschool time must be spent doing the kinds of things we know make a difference in fluency: exploring, discovering, and tinkering—learning by doing.

LET'S CREATE AN INFRASTRUCTURE THAT HELPS TO BUILD PARTNERSHIPS. Partnerships and networks can make a real difference in ensuring that learners have access to truly effective, high-quality programs. Supporting STEM networks is an effective way to expand opportunities, make sure that good programs keep getting better, and ensure that fledgling programs can learn from more experienced sites.

Supporting Examples:

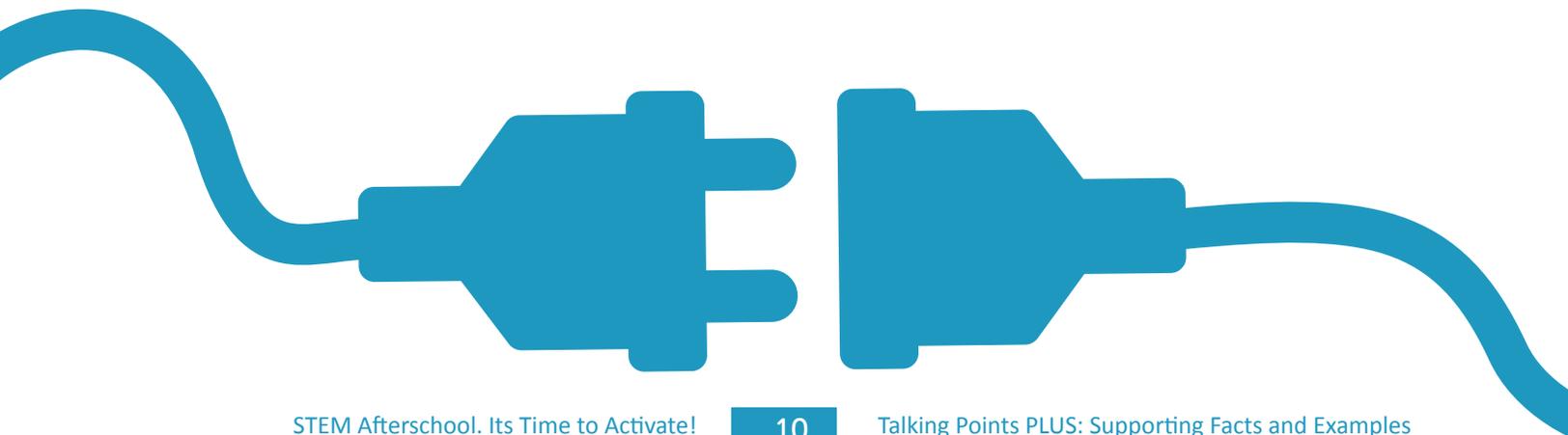
- A study of one state's afterschool programming found that when a site had a STEM partner, such as a science museum, an engineering firm, or a university, the experiences that students had tended to be much better in a variety of ways. The partnerships often weren't very large—this was a case where a little bit of effort went a long way. Supporting the infrastructure that afterschool and summer learning providers need to connect with science professionals and experts in their region is an important, feasible step we can take.
- State networks can make a real difference in growing a thriving ecology of STEM learning opportunities—it's helpful to learn what other states are doing, borrow ideas that are working well elsewhere, and refine your own ideas based on input from people who are in a similar situation to yours. More recently, state coalitions have also started to come up with projects they can work on together, which amplifies the impact they can have. Right now, most states have at least gotten started on creating a statewide afterschool network. We can build on this promising direction by building deeper collaborations between afterschool and STEM networks

in every state; right now, there are states without them, and the ones that do exist could use more support.

- When local afterschool efforts are coordinated, more students tend to benefit from programs that fit their interests. A 2013 study of large U.S. cities found that the majority (77 percent) are coordinating the afterschool landscape somehow, which is a great start—but it also means there are many communities where this work isn't happening yet. And, without more intentional support, this emerging infrastructure may be at risk. Over the past five years, a third of cities (34 percent) saw funding for program coordination decrease, and in another quarter (25 percent) of the cities sampled, there was no city funding for afterschool coordination to begin with. (Source: <http://www.wallacefoundation.org/knowledge-center/after-school/coordinating-after-school-resources/Documents/Is-Citywide-Afterschool-Coordination-Going-Nationwide.pdf>)
- When cities and counties take a practical, step-by-step approach to making sure that afterschool STEM opportunities are high-quality, well-staffed, and that the families and schools know about them, we all benefit from the sparks of learning that start to fly. A great example of this is the Frontiers In Urban Science Exploration initiative, which uses a model that's worked well in locations across the country (New York City, Providence, Oakland, Baltimore, Boston, Chicago, and Palm Beach County, FL). These initiatives focus on making programs better, expanding them, and making sure they're sustainable—and there are so many different ways of doing this it's hard to sum it up. Perhaps the key ingredient is designated staff who wake up every day thinking about how to make sure there is more STEM learning being activated every day. (Source: *Every Hour Counts*: <http://afterschoolsystems.org/content/document/detail/4020/>)

LET'S DEVOTE MORE RESOURCES TO AREAS THAT HAVE LESS ACCESS.

- One practical way to create greater fairness across places is by supporting community asset maps. Because modern society is powered by science, technology, engineering and math, there are STEM learning resources everywhere. However, program leaders might not always know about them, or recognize them as such. For example, one community might not have a local engineering design firm, but they could have a factory where engineers work. Those engineers could serve as mentors or guest speakers, or play other roles in an afterschool STEM program. By systematically mapping out the professionals, companies, organizations and other STEM resources that are present in a community, communities can connect to these science-rich partners and tap into their expertise to enrich afterschool programming. The creation of statewide networks has been one effective way to support communities in creating asset maps and using them to improve STEM learning.

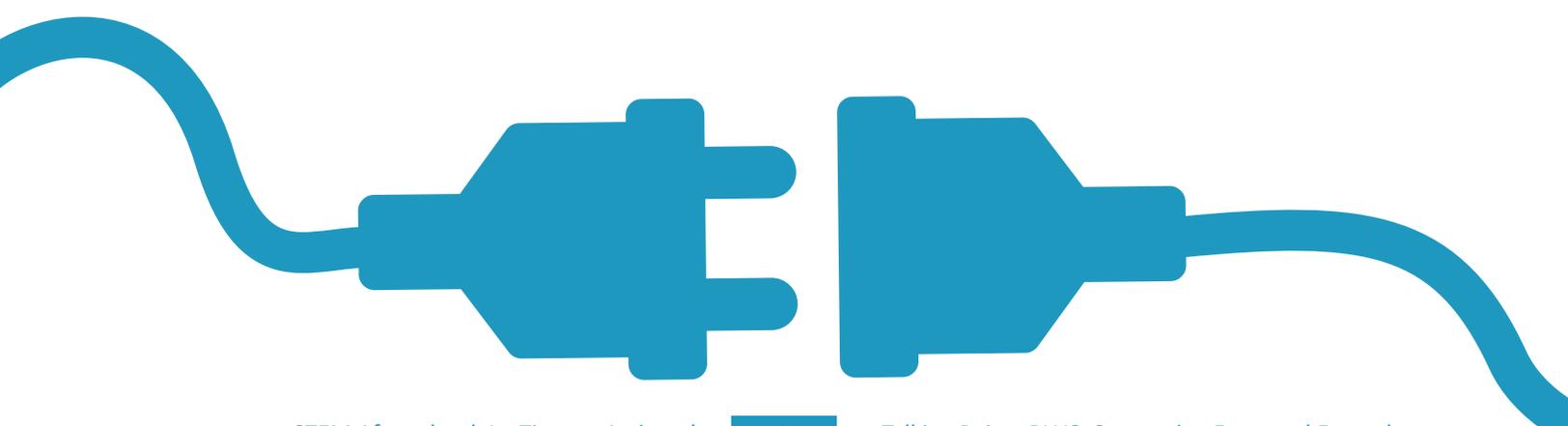


- We need to do a better job of supporting the adults who work in afterschool STEM programs. Because they are building important learning environments, we need to make sure they have the support and scaffolding they need to do their jobs well. This includes the materials and resources necessary for creating hands-on experiences for students, and opportunities to build their own knowledge and skills through professional development, and attractive pay. When we create the kinds of conditions that inspire them to stay in their positions for the long-term, then those adults have the chance to learn more and get better year after year. This, in turn, leads to better experiences for kids—and to more of the STEM learning that our societies need.

TO GET READY FOR A STEM-DRIVEN FUTURE, WE HAVE TO FIND WAYS OF IMMERSING—AND INCLUDING—ALL YOUNG PEOPLE IN RICH STEM LEARNING. Traditionally, there have been fewer young women and fewer young people of color who pursue STEM majors in college or go on to STEM professions. To build and maintain our nation’s shared prosperity, we need to expand our pool of STEM talent and we can’t afford to leave anyone out. Because afterschool programs have the flexibility to respond to young people’s interests and cultures, and because hands-on, exploratory experiences are known to be effective ways to turn young people on to new interests, afterschool STEM is an essential resource for including groups of kids who might not otherwise consider these fields. By expanding afterschool STEM, we can engage more girls, more African Americans, and more Hispanic youth in these critical, growing areas. Immersing and including all students in STEM learning leaves us all better off in the long run.

Supporting Data Points to Choose From:

- To build and maintain our shared prosperity, and to take advantage of the opportunities ahead, we need to ramp up the numbers of young people who are equipped to move into these fields. To do that, we need to include everybody. That isn’t happening now. For instance, women make up about half of the workforce (48 percent) but only a quarter (24 percent) of the STEM workforce. There’s a similar trend for African Americans and Hispanics, in that they participate in the STEM professions at about half the rate you’d predict based on their proportion of the workforce. Think about that: all these workers are heading off to other areas, fields that may be stagnant or declining, while at the same time, we know we have STEM shortages ahead of us. To be ready for what’s ahead, we have to engage groups in STEM that have been underrepresented in the past.
- Afterschool programming already reaches a pretty substantial proportion of groups who are underrepresented in STEM fields—24 percent of African American kids in the US, and 29 percent of Hispanic youth. If we want to activate STEM learning among more children of color, we know where to find them! The task now is to make sure that we have enough programs that let kids explore and experiment, because that’s what sparks their interest and keeps it fueled.



Quick Start Campaign Guides

INSTEAD OF THIS...WE'RE TRYING THIS...

Framing is a process of making choices about what to emphasize—and what to leave unsaid. Here's a quick tour of themes to avoid, compared with alternatives to advance.

INSTEAD OF THIS...	WE'RE TRYING THIS...
STEM	Science, technology, engineering, and math—the subjects called STEM.
Out-of-school time	Programs that meet in the afternoons, on the weekends, or during the summer.
To remain competitive in a global economy...	To build our shared prosperity...
Individual gain: STEM degrees lead to high-paying careers.	Collective benefits: Innovation drives the economy for us all.
Skills Crisis: U.S. can't fill STEM jobs, so they go overseas.	Opportunity Ahead: Sector is growing—let's grow with it.
Benefits to Students: Kids learn to solve problems and think critically.	Benefits to Community: STEM builds skills society needs for our complex future.
Afterschool Expands Learning Time: Afterschool keeps the academic clock ticking.	Afterschool Makes Unique Contributions: Exploratory, supportive, flexible settings let kids learn in a different way.

To see the research behind these recommendations, visit <http://frameworksinstitute.org/k12-stem-learning.html>

Fact Sheet

MAKING THE CASE FOR STEM AFTERSCHOOL

AFTERSCHOOL: TIME TO LEARN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH

The interconnected subjects of science, technology, engineering and math (STEM) give us the knowledge and tools for improving the systems that power our economy and advance our society. In fact, the primary driver of the future economy will be innovation, largely from advances in science and engineering. To maintain and expand our nation’s shared prosperity, we need to expand learning in STEM.

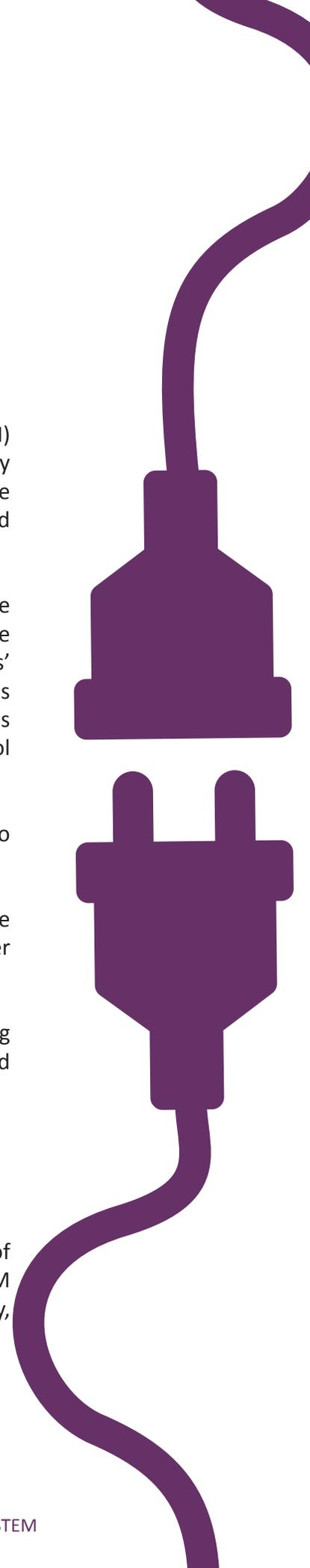
Afterschool time is a valuable resource in preparing the next generation for the jobs—and world—of tomorrow. Because afterschool and summer programs have great flexibility and can vary the modes of learning, they can help ignite students’ curiosity and interest, especially for those who might not think of themselves as “math and science kids.” By providing hands-on experiences and spaces where kids can get immersed in projects or experiments that match their interests, afterschool participation turns on interest in these important fields.

Afterschool makes a measurable difference. When children and youth have access to great STEM programming afterschool, we all benefit. Evidence shows:

- Afterschool STEM participation sparks interest, builds skills, and puts more students on the path toward majoring in a STEM discipline and pursuing a career in these much-needed fields.
- Afterschool STEM participation supports college and career readiness, boosting proficiency in math and science, and increasing the likelihood of graduation and post-secondary training.

MOVING FORWARD

Children spend only 20 percent of their waking hours in school. To make the most of the other 80 percent, we should use afterschool time to immerse students in STEM in ways that look and feel different from school. To build the nation’s STEM fluency, we can:



- Increase funding for afterschool programs in science, technology, engineering and math. Building on the success of the 21st Century Community Learning Centers initiative, it makes sense to establish competitive grants for afterschool STEM programming.
- Embrace afterschool in educational planning and policies. For instance, state STEM learning committees should include representation from afterschool and other informal learning sites.
- Equip afterschool program leaders more effectively. For example, the training and resources that are available to classroom teachers should also be accessible to afterschool program providers.

Afterschool STEM programs turn kids on to these fields—
putting us all on the path to a bright future.

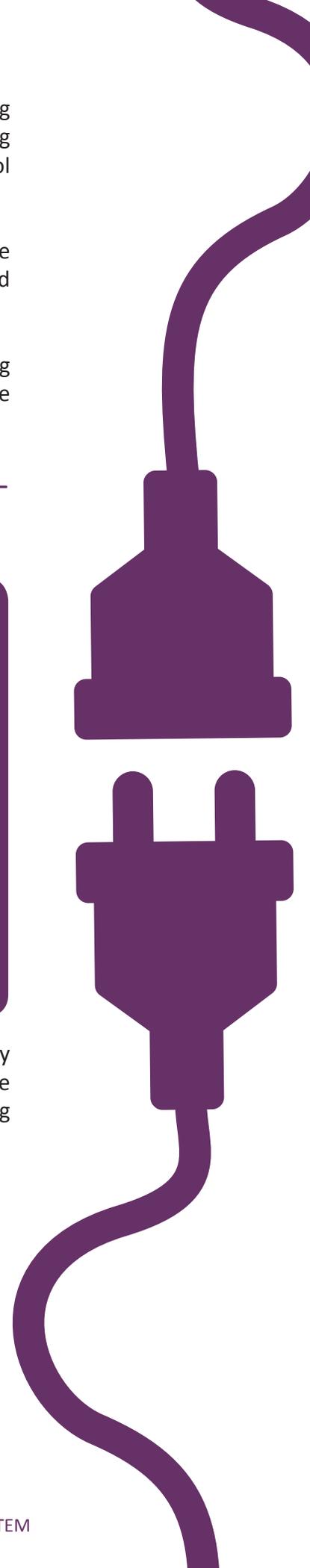
The Need Is Growing.

Between 2008 and 2018, the nation's need for STEM professionals will grow by 17 percent—which is more than the projected growth for administrative work, sales, and transportation combined. *(Source: Bureau of Labor Statistics.)*

Growing STEM Grows Jobs.

By adding to the sectors that develop new products and services, we add to the pool of people creating jobs for our economy. One job in the high-tech sector leads to four new jobs in local goods and service industries. *(Source: Bay Area Council.)*

We need more engaging settings for students to immerse themselves in, especially in STEM. Nationwide, for every child in an afterschool program, there are two more waiting to get in. Learn more about proposals to strengthen the network of engaging afterschool STEM opportunities at afterschoolSTEMhub.org



Fact Sheet

MAKING THE CASE FOR STEM AFTERSCHOOL

AFTERSCHOOL: TIME TO FOSTER FLUENCY IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH

Given our complex and changing world, America needs today's students to be critical thinkers who can tackle modern challenges. Learning in science, technology, engineering and math—the subjects called “STEM”—builds the knowledge and skills needed to tackle problems systematically. STEM helps to build the ability to sift through information, draw reasonable conclusions, make decisions based on evidence, and come up with creative solutions.

Afterschool time is an important resource in ensuring that all U.S. students have a command of STEM. Just as people need to be immersed in real-world situations to learn a language, children and youth need to explore STEM in their everyday lives to become fluent in these subjects.

A recent National Research Council report highlighted the “effectiveness factors” that distinguish high-quality afterschool STEM programs. Among other things, the most effective programs engage young people intellectually, academically, socially and emotionally, weaving these aspects of learning together as if they were strands of a rope. And, since they recognize that this kind of weaving takes time, they offer sustained experiences over time. With consistent opportunities to do the kinds of things STEM professionals do—like pose questions, set up experiments or simulations, and make sense of raw data—learners can develop the strong critical thinking and problem-solving skills needed today. The flexibility of programs offered afterschool, on weekends, or in the summer lets kids practice these skills in a relaxed environment, mentored by supportive adults.

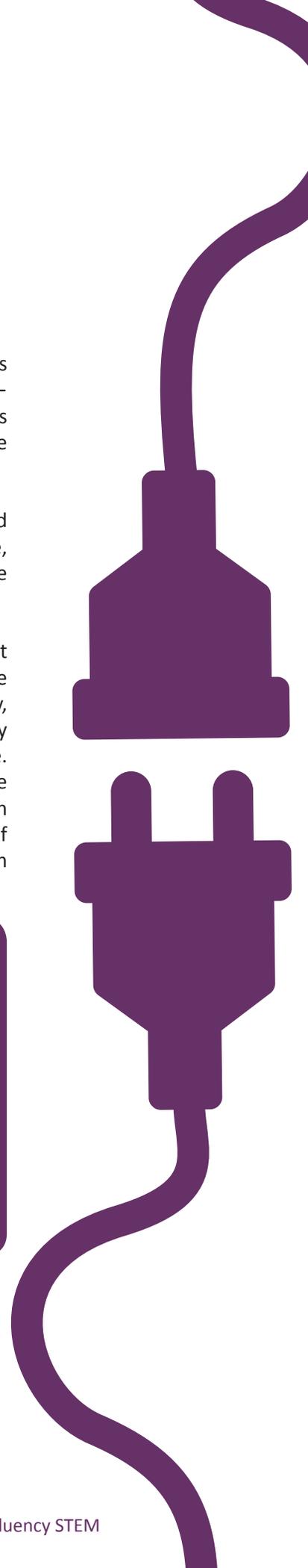
Frequency Fosters Fluency

A recent study compared 4th-graders who were involved almost daily in hands-on science with those who only got a chance to participate once or twice a month. Since STEM concepts are learned best through multiple exposures, the results aren't surprising: the students who were immersed in science had more advanced fluency than those with fewer touch-points. By expanding regular programs to areas that don't have them, and by intentionally connecting more kids to the opportunities that already exist, we can increase our nation's level of STEM fluency.

WHAT DOES THIS LOOK LIKE?

Turn the page to see a great example of an engaging afterschool STEM program!

We need more engaging settings for students to immerse themselves in, especially in STEM. Nationwide, for every child in an afterschool program, there are two more waiting to get in. Learn more about proposals to strengthen the network of engaging afterschool STEM opportunities at afterschoolSTEMhub.org



SWAP THIS PAGE OUT!
CUSTOMIZABLE AREA FOR USERS TO
ILLUSTRATE AN ENGAGING PROGRAM,
AND EXPLAIN HOW THE LEARNING ACTIVITIES
LEAD TO DESIRABLE STEM OUTCOMES.

Why These Themes?

FAQs ABOUT FRAMES

FRAMEWORKS INSTITUTE RESPONDS TO AFTERSCHOOL STEM ADVOCATES QUESTIONS ABOUT REFRAMING.

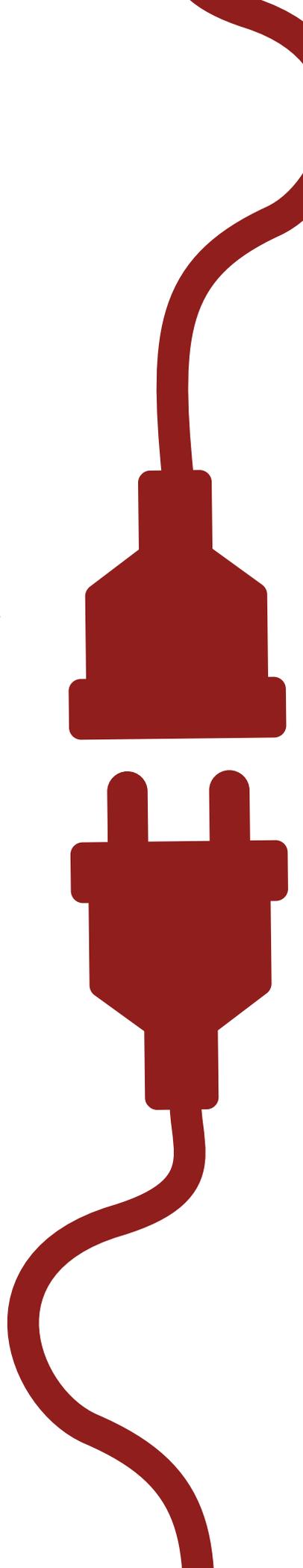


We've been using a global competition argument for years, but I notice that's not recommended as a strategic frame. Why?

Great question! FrameWorks' research showed that using Global Competition as a Value frame often backfired by triggering a few highly unproductive patterns of thinking. For one, it prompted people to take an *Us-Versus-Them* mindset, often evoking xenophobic attitudes toward other nations. That kind of thinking sometimes turned inward, prompting people to wonder about the role of group differences within the U.S. (i.e., "who's holding us back?"). This line of reasoning is likely to depress, rather than build, support for addressing racial or gender disparities.

Other problems with the *Global Competition* frame stemmed from its effects on people's thinking about solutions. For some, it cued up a belief in *American Exceptionalism*—an assumption that the nation has a perpetually assured place at the top of the global order—leading the public to conclude that little needs to be done or changed. For others, it conjured up a deep sense of *Fatalism*, prompting narratives about the waning of US dominance, and leading to the conclusion that national decline is inevitable and irreparable. As a result, people had a difficult time imagining or supporting approaches to improving education, because, they reasoned, there really is no solution.

For all these reasons, we strongly recommend avoiding positioning informal STEM within a *Global Competition* frame. Instead of invigorating an unproductive narrative about America's best days being behind her, appeal to *Collective Prosperity*, the idea that by improving afterschool learning in science, technology, engineering and math, we contribute to a stronger economy and a vibrant, modern society. This forward-looking frame is more hospitable to a range of meaningful education reforms than a backwards-looking frame.





Among CBOs and policy makers, we're used to talking about 'out of school time' (OST). Why does this campaign stick to 'afterschool' and recommend the phrase 'programs that meet in the afternoons, on the weekends, or during the summer?' That seems really long!

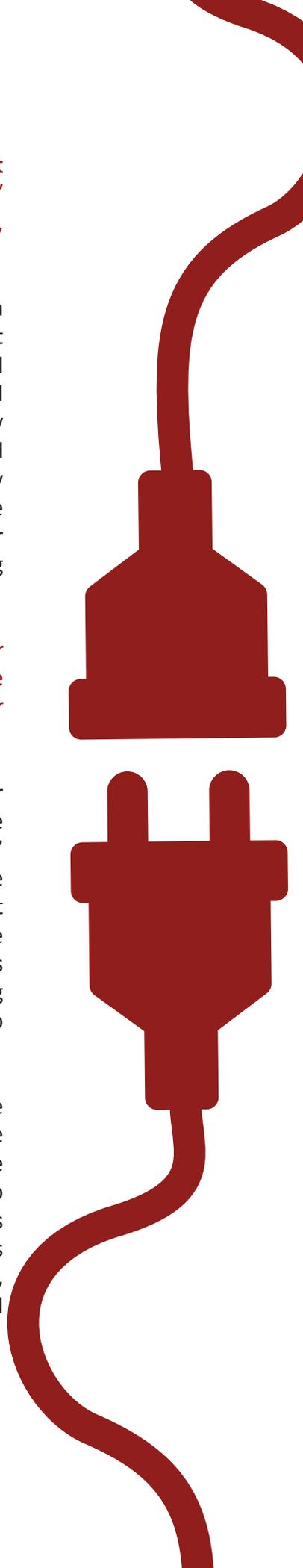
FrameWorks' research on public perceptions showed that the Americans hold a strong model of 'compartmentalized learning,' which involves the assumption that 'academics' are best learned during the traditional school day, and time out of school should be reserved for non-academic experiences. The assumption also involves a fixed hierarchy: school learning is primary and essential, and the 'other stuff' is secondary and non-essential. To build support for informal STEM learning, communicators need to disrupt this assumption somehow. The language of 'out-of-school' keeps a binary distinction in place. The recommended alternative, 'learning opportunities in the afternoons, on the weekends, or during the summer' is admittedly a bit clunkier to use, but it has the virtue of just naming the time for what it is, without defining informal learning time by its contrast to formal learning time.



Our organization is proud of our work to end race and gender inequities with respect to access to STEM learning and workforce opportunities. Why shouldn't we lead with those efforts in our communications?

"Lead with" is the key phrase here. How communicators begin has implications for how people interpret, understand, and act upon the information that follows. Some kinds of information, when used at the start of a communication, can cue up listeners' unproductive patterns of thinking. FrameWorks' research shows that when an issue is framed as mattering "because of" or "for" a specific group, deficit thinking about group differences are activated, and "zero-sum game" reasoning becomes much more likely. In turn, these patterns of thinking depress support for reforms and initiatives aimed at achieving greater equity. In contrast, when an issue is framed as something that all Americans have a stake in, disparities can then be positioned as a threat to that shared value—a strategy that generates much greater support.

It's also important to establish a clear and concrete explanation for how disparate outcomes arise, in such a way that heads off the assumption that outcomes are due to personal willpower. For this reason, the campaign appeals to the tested Value *Fairness Across Places*. This frame element reliably directs the public's attention to the inequitable distribution of resources—toward systems, not people—and helps illuminate system-level solutions. The Explanatory Metaphor *Charging Stations* works in a similar way, encouraging people to engage in asset-mapping. Within this frame, the public and policy makers are better able to appreciate how public solutions and support can make a difference for underrepresented or underserved groups.





What's wrong with telling a success story about a star student—say, a child who was struggling in school, but got inspired by afterschool STEM? People love those stories.

To build the public's support for policies and programs designed to fix systemic problems, communicators need to build people's understanding of the underlying causes of social problems. Too often, however, the stories that circulate in public discourse focus narrowly on individual actors making choices void of such context. Tales of the triumphant individual who beat the odds feed the public's belief that personal choice is the primary determinant of people's outcomes and obscure the social determinants that shape our lives. This in turn limits people's ability to understand and support the kinds of collective or system-level solutions required to address social issues successfully.

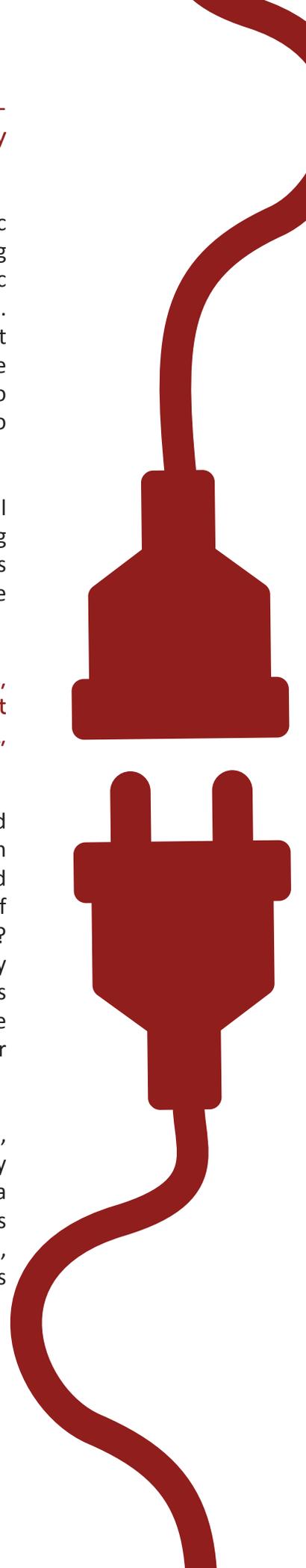
In contrast to these hero stories, thematic stories explain the nuts and bolts of social problems: what's at stake, how they work and what can be done to fix them. By telling a thematic story—widening the lens to include as a vital part of the story the contexts and environments that affect people's lives—communicators can tell a more effective narrative that highlights systems, processes, collective action, and policy solutions.



Afterschool providers tend to have great relationships with families, and frankly, are an essential support for many working families. Yet I don't see much about family engagement, or families in general, in this communications strategy. Why?

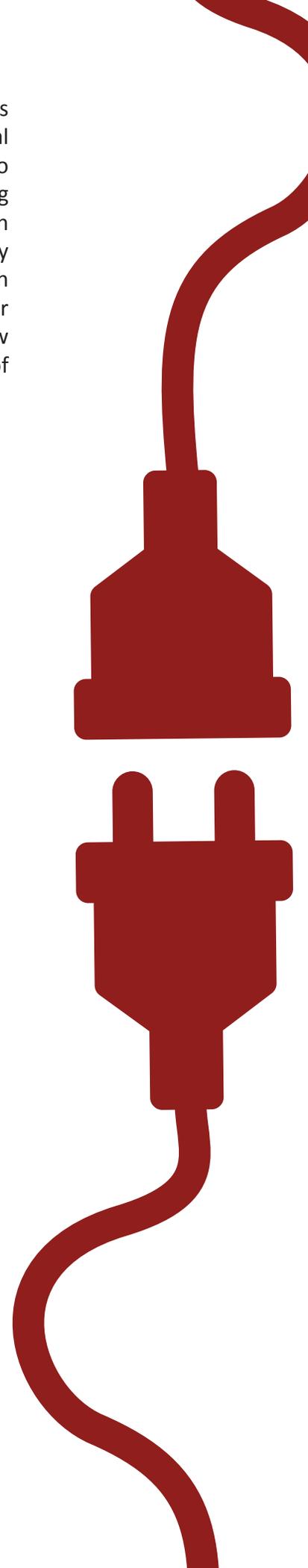
The reason has to do with the difference between the social analysis of an issue and the communications analysis of an issue. It's true that afterschool providers are an important source of childcare for working families. However, if the goal is to build support and demand for quality afterschool options, then bringing up this aspect of afterschool isn't particularly helpful, and could even prove counterproductive. Why? The average American citizen assumes that arranging for childcare is the responsibility of individual families. Reminding the public that afterschool programming meets childcare needs is likely to dampen support for the public funding necessary to make afterschool options widely accessible. The public is likely to wonder, "Why are other people's babysitting problems my concern?"

A similar line of reasoning leads us to recommend that, at least for this campaign, communicators avoid highlighting 'family engagement' as a critical element of quality afterschool STEM. Again, it's not a matter of disagreeing with the premise; it's a matter of choosing priorities strategically. Across dozens of studies FrameWorks has conducted on a variety of issues involving children (early learning, child maltreatment, juvenile justice, K12 education, and more), the cultural model of *Family Bubble* has



emerged as a remarkably strong influence on public thinking. *Family Bubble* involves the assumption that children’s outcomes are exclusively the result of parental characteristics and values, and moreover, that very little gets “into” the bubble to influence a family’s decisions about childrearing. It takes a great deal of careful framing to get any sort of socioeconomic, systemic, or structural factors into the discussion in a productive way. Because ‘family involvement’ has the risk of bringing up Family Bubble thinking—and with it, deficit attitudes about working families or families with low educational attainment—we’re focusing our communications resources on other aspects of quality afterschool STEM. Specifically, this campaign is focusing on a few elements of quality, such as the importance of the STEM content areas, and the fit of STEM practices and pedagogy with youth development.

To see the research behind these recommendations, visit <http://frameworksinstitute.org/k12-stem-learning.html>



Communications Research Base

To help the afterschool STEM field communicate more powerfully, the Noyce Foundation engaged the FrameWorks Institute to investigate how ordinary Americans think about STEM in formal and informal learning contexts, and to identify more effective ways of explaining these issues. In a related project, the Mott Foundation sponsored research into the communications aspects of afterschool learning. Here are links to the original studies and related resources.

[The Power of Explanation: Reframing STEM and Informal Learning.](#)

Recommends specific reframing tools that demonstrate strong effects in addressing the conceptual challenges faced by communicators in talking about STEM learning reforms.

frameworksinstitute.org/pubs/mm/reframingstem/

[Telling the STEM Chapter of the Education Core Story: A Communications Toolkit.](#)

A collection of framing research, recommendations and sample communications designed to help leading voices explain learning in science, technology, engineering and math in such a way that builds public understanding and will on STEM issues, while also supporting a broader reframed narrative about education as a public good.

frameworksinstitute.org/toolkits/STEM/

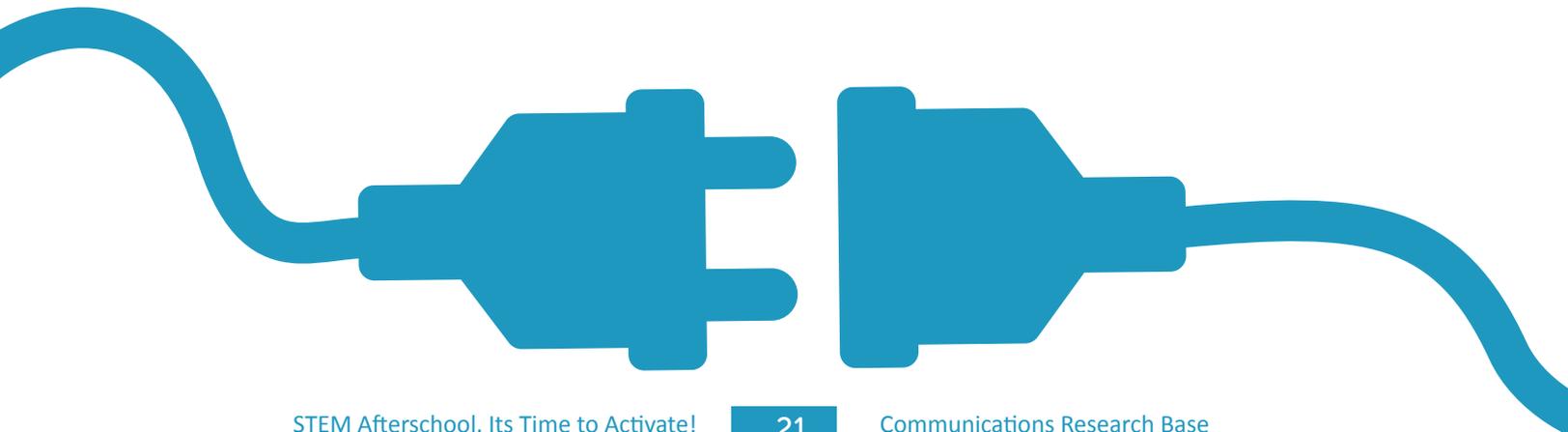
[“You Have to Have the Basics Down Really Well”: Mapping the Gaps Between Expert and Public Understandings of STEM Learning.](#)

Compares expert and public perspectives on STEM education and informal learning, identifying specific opportunities for bringing new information and new ways of thinking about STEM education into public thinking and conversation.

frameworksinstitute.org/assets/files/PDF_STEM/STEMMTG10-18-13_proofedandformatted.pdf

[Missing Matter: Holes in the Media Narrative about Informal and Formal STEM Learning.](#) Analyzes 283 relevant stories from newspapers, television broadcasts, and news-oriented blogs to deepen understanding of the media narrative that shapes public understanding.

frameworksinstitute.org/assets/files/PDF_STEM/MissingMatterformatted3.14.14final.pdf



[Narrative Holes in STEM Storytelling: A Field Frame Analysis.](#)

Analyzes communications materials from organizations advocating for STEM education reform, pointing out themes and trends suggesting that changes in advocacy tactics might be warranted.

frameworksinstitute.org/assets/files/PDF_STEM/MissingMatterformatted3.14.14final.pdf

[Mapping the Gaps on Where and When Learning Takes Place.](#)

An interactive multi-media report that compares expert explanations with public understandings of the spaces and times where learning occurs, yielding insights into opportunities for building public awareness.

frameworksinstitute.org/pubs/mtg/learningspace/index.html

[How Media Portray Learning Space and Time.](#)

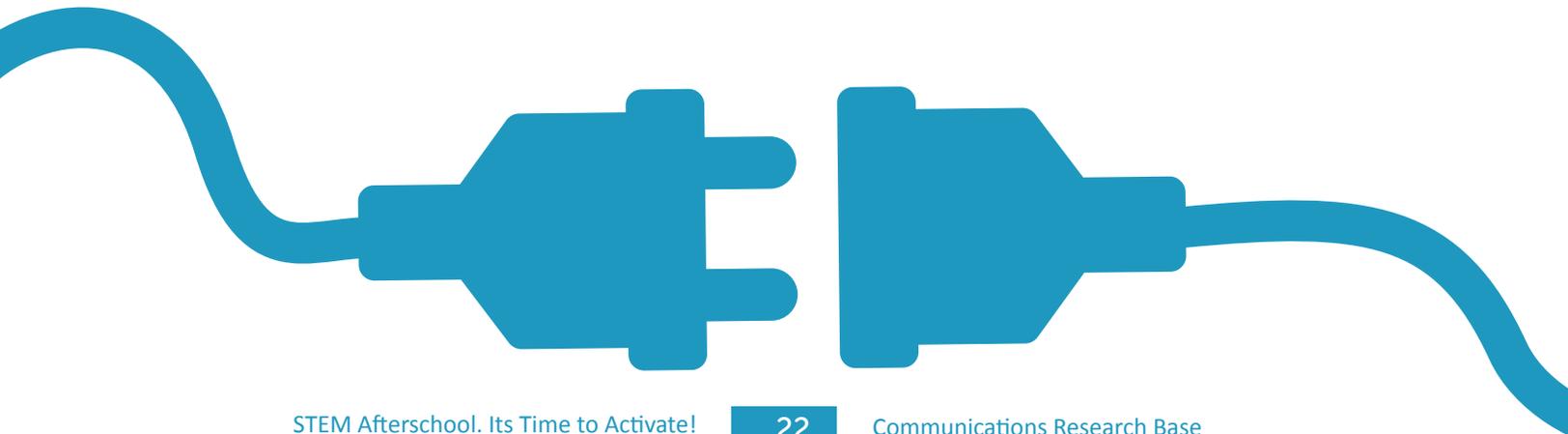
Examines dominant media frames regarding learning space and time, pointing out opportunities for advocates to influence the conversation.

frameworksinstitute.org/assets/files/ed-core-story/ecs_mca_space_and_time_final.pdf

[Putting It Back Together Again: Reframing Education Using a Core Story Approach. A FrameWorks MessageMemo.](#)

Recommends specific reframing tools that showed strong results in shifting public thinking away from nostalgia-driven pushback to time reforms, and built public support for expanding out-of-school learning opportunities.

frameworksinstitute.org/pubs/mm/ecs/



The afterschool STEM Hub is a collaboration among afterschool leaders and stakeholders to provide coordinated messaging and communications that impact advocacy and policy and help ensure the important place of afterschool programs in the STEM learning ecosystem.

Led by the Afterschool Alliance, the STEM Hub is funded by the Noyce Foundation and includes the following organizations: 4-H, Association of Science-Technology Centers, Boys and Girls Clubs of America, Cornell lab of Ornithology, Every Hour Counts, Exploratorium, Girls Inc., National Afterschool Association, National Girls Collaborative Project, Program in Education, Afterschool & Resiliency, Statewide Afterschool Networks (represented by Oregon After School for Kids and Indiana Afterschool Network), Techbridge, The After-School Corporation, University of Virginia, and the YMCA of the USA.



**AFTERSCHOOL
STEM HUB**

