



**SUSTAINABLE
FUTURES**

Sustainability and Museums:

A Workbook for Improving Operations, Engaging Communities, and Creating Partnerships

By **Nicholas Weller and Rae Ostman**

NISE
NATIONAL INFORMAL
STEM EDUCATION
NETWORK

www.nisenet.org



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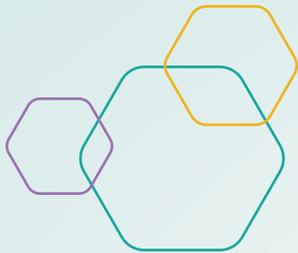
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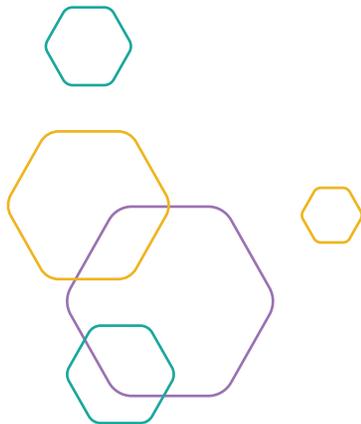
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INTRODUCTION

Sustainability means healthy people, communities, and environments, now and in the future. To make our planet sustainable, we need to ensure the well-being of all people, build strong and resilient communities, and live responsibly with our natural environment.

Museums, science centers, zoos, aquariums, gardens, nature centers, and other informal learning organizations can all play an important role in helping make their communities sustainable. Sustainability ideas and initiatives can help your organization build partnerships, create thematic connections among existing programs, improve operations, create community and promote learning, and contribute to a global movement for a sustainable future.



About this workbook

We developed this workbook in collaboration with sustainability scientists and museum professionals who have participated in the Sustainability Fellowship program offered by Arizona State University in partnership with the NISE Network. The *Sustainable Futures* initiative supports museums and similar cultural organizations in their efforts to integrate sustainability into all aspects of their institution, including decision-making, operations, programs, and community partnerships. (Note: Throughout the workbook, we often use the term “museum” as shorthand for a broad range of informal education and cultural organizations.)

Here, we share promising practices and research findings that emerged as museum professionals planned and implemented sustainability-related projects at their organizations within a supportive community of practice. This resource summarizes conceptual findings and offers practical advice that came out of this research and practice effort.

Through the fellowship program and professional learning community, we’ve observed many organizations embrace the complex nature of sustainability, build interest among their staff and visitors, and develop unique programs and practices around sustainability. We’ve studied how participants navigate the concept of sustainability through the actions they took to embody sustainability at their organizations.

How do museum professionals go about embracing and implementing sustainability? How do they understand and address challenges associated with sustainability?

We investigated these questions in two connected ways. First, as organizers of the fellowship program, we developed various activities and approaches to support museum professionals in their sustainability efforts. In the pages that follow, we'll share some of those resources, as well as ways we changed or supplemented them with feedback from others in the community. We also gathered evaluation data through surveys and interviews that helped us understand the impact of the fellowship experience on about 90 professionals. Second, we closely followed the experience of 12 museum professionals as they participated in the fellowship and worked on their projects, and observed them as they participated in meetings and workshops, reviewed documents they produced, and conducted a series of semi-structured interviews.

This workbook shares promising practices, tools, considerations, and case studies for incorporating sustainability into all aspects of museum work. It's organized into seven chapters. The first and second chapters provide an introduction to sustainability and museums. The third through sixth chapters share our findings, categorized into four parts based on the types of projects museums undertook as part of the fellowship. Finally, the seventh chapter offers closing thoughts for both museum professionals and the broader sustainability community. The workbook concludes with a selection of additional resources that you may find helpful as you plan and implement sustainability projects at your organization.

Throughout this workbook, you'll find links to activities, planning materials, and other resources you can use to plan sustainability efforts at your organization. There are also prompts for reflection and conversation to assist you in thinking through key concepts and planning next steps.

The NISE Network

The National Informal STEM Education Network (NISE Network) is a community of educators, scientists, and others who are dedicated to supporting learning about science, technology, engineering, and math (STEM) across the United States. Our mission is to bring people together to engage in STEM, understand our world, and build a better future for everyone. The NISE Network fosters collaboration and draws on the collective strengths of our partners.

We achieve our reach and impact through the participation of over 700 partner organizations in Network activities—including museums, universities, and other organizations that provide informal learning opportunities for public audiences. Network projects create educational materials and support professional learning, while Network partners implement project activities locally. Together, NISE Network partners engage 15 million people each year in high-quality STEM learning. As a professional community, we are committed to learning alongside each other and our partners, and to evolving the way we work as a result.



NISE Network partners engage public audiences in learning about current science, technology, math, and engineering in all 50 states and several US territories.

SUSTAINABILITY AND MUSEUMS

Introduction to sustainability

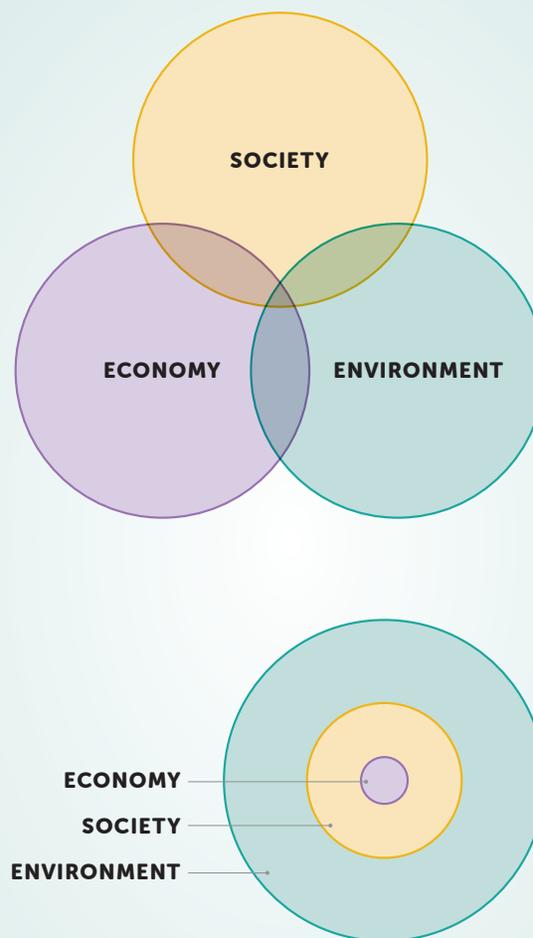
Sustainability is a big concept with many definitions. Some key features extend across these varying definitions: a focus on the needs of today, the needs of people tomorrow, the impacts of today's decisions on the future, and the interconnections of human and natural systems.

One of the most common interpretations of sustainability is known as the Brundtland definition, named after a United Nations report on the environment published in 1987. The report defined sustainability as meeting the needs of today without impairing the needs of future generations to meet their needs. In this definition, people's needs include basics such as food, shelter, and water, but also elements of well-being such as happiness and respect.

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

– United Nations (1987)

Another common way of thinking about sustainability is the three pillars concept: Sustainability requires considering how *environmental*, *social*, and *economic* systems interact, locally and as part of a global ecosystem. (A similar concept is the triple bottom line model, which underscores the same point in a business context.)



Sustainability emphasizes the interaction of people, society, and the natural environment. Some definitions conceive of sustainability as a series of overlapping domains (top), while others emphasize that the economy is embedded in society, which is in turn part of the natural ecosystem (bottom).

Some definitions of sustainability are difficult to implement in everyday life or a museum setting. Most academic definitions offer criteria for evaluating success, such as the ability to meet today's needs while not compromising future generations' abilities to meet their own needs. But such definitions don't tell us *how* to be sustainable. And anyone who's ever considered the question "Paper or plastic?" at a grocery store knows that it's not easy to assess the relative sustainability of everyday choices, much less the interrelated elements of our global economy.

To make sustainability more accessible and to connect it with values that may be held across a community, we use the following definition:

Sustainability means healthy people, communities, and environments, now and in the future.

Sustainability means healthy people, communities, and environments, now and in the future. This definition emphasizes the goal of working together to build a better future for people and the planet, without making assumptions about the priorities of the people participating or the solutions that will work best for their community.



Putting sustainability into practice

There are additional challenges to operationalizing sustainability in a museum context. The term may seem unfamiliar, all-encompassing, or tied to topics that attract controversy and uncertainty, such as climate change or environmental protection.

A museum in coal country faces different challenges for building programs and practices about climate change than a museum in a coastal community threatened by sea level rise. More basically, people may reasonably think "sustainability" means keeping things as they are ("sustaining" or "maintaining" them), or that sustainability is simply too big a goal for them to make an impact.

But it's well worth tackling sustainability in museums. Along with its challenges, sustainability is important and can serve as a unifying concept. At universities, cities, and businesses across the country, sustainability projects bring together people interested in making the world a better place by sharing diverse concerns, such as socioeconomic inequality, pollution, electric vehicles, and the industries of tomorrow.

"[A broader view of sustainability] really helped me get a better grasp of how deep sustainability can go in a museum setting. I've found myself thinking every day about the little decisions that we can make, or the small things we can tweak, to be a more sustainable institution." — Museum professional

Museums are well positioned to model ideas and actions associated with sustainability and to share these ideas with their visitors and wider communities. Museums can walk the talk by working to make their own facilities and operations sustainable as well as creating engaging, accessible, and thought-provoking learning experiences about sustainability for people of all ages and backgrounds

To understand how museums can become more sustainable—and share ideas about sustainability with their guests and communities—



we find two additional frameworks to be useful. The first framework is the United Nation’s Sustainable Development Goals (or SDGs, also called the Global Goals for Sustainability). The second is the concept of education *for* sustainability (sometimes abbreviated as EfS).

Global Goals for Sustainability

Adopted in 2015 by UN member countries, including the United States, the SDGs outline a pathway to a better and more sustainable future for all. The goals integrate many important human development challenges, like poverty and equality, with environmental challenges, such as climate change and urban development. They address the interconnected challenges we face around the world and recognize that ending poverty must go hand in hand with strategies that build economic growth, address social needs, and tackle climate change and environmental protection (United Nations, 2015). The SDGs help break down the big idea of sustainability into discrete—though still ambitious—goals and strategies. For this reason, and as discussed in more detail in later chapters, the SDGs can help museum professionals structure and plan sustainability efforts at their institutions.

Education for sustainability

Museums and other cultural organizations, in line with their missions, strive to offer relevant, engaging, and meaningful learning opportunities. This can include experiences that are explicitly *about* sustainability, but it can also include learning that is essential to or useful *for* sustainability. The work that museums do to inspire love for nature, support 21st-century skills, or promote cross-cultural understanding is all important to accomplishing global goals *for* sustainability, even if they're not presented as being *about* sustainability (Cloud et al., 2017). (You'll find more information about education for sustainability in the Education and Learning chapter of this workbook.)

“Education for sustainability develops the knowledge, skills, values and world views necessary for people to act in ways that contribute to more sustainable patterns of living. It enables individuals and communities to reflect on ways of interpreting and engaging with the world. Sustainability education is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through informed action. Actions that support more sustainable patterns of living require consideration of environmental, social, cultural and economic systems and their interdependence.”

– Australian Curriculum for Sustainability



Museum professionals embrace a broad definition of sustainability based on the UN SDGs, which allows them to link together sustainability efforts and build support across their organization.

QUESTIONS FOR REFLECTION:

1. Which definition of sustainability resonates with you? It could be one that we shared here or another that you're familiar with. Are any of the definitions of sustainability surprising to you?
2. What values do you see as associated with sustainability? How do these connect with values that are important to you and your organization?

READY-TO-USE RESOURCES

Try these tools to help your team reach a common understanding of sustainability and relate it to your organization's mission:

- **Sustainability and Museums** slide deck that introduces sustainability and the role museums can play in creating a sustainable future
- **What Is Sustainability?** and **Why Sustainability?** guides provide a short overview of sustainability for museums and similar cultural organizations
- **Sustainability Values** worksheet to reflect on the values your team associates with sustainability

These tools are available for free download from the NISE Network website. www.nisenet.org/catalog/sustainability-professional-development-resources



THE WHOLE INSTITUTION APPROACH TO SUSTAINABILITY

The UNESCO (United Nations Educational, Scientific and Cultural Organization) *whole institution* approach provides a useful way to think about all the different ways your organization can pursue sustainability. This approach emphasizes that sustainability is important to all aspects of an organization and articulates four major areas of effort that are common to most cultural organizations: education and learning, facilities and operations, policy and governance, and community partnerships.

A whole institution approach helps link day-to-day decisions and long-range planning to sustainability. It can help museums establish priorities for sustainability efforts. Your organization might choose to begin—or strengthen—your sustainability work in any of these areas depending on your mission, strategic plan, and capacity. Ultimately, an organization that is committed to sustainability is likely to integrate sustainable ideas and actions into everything you do.

If your organization is new to sustainability, a comprehensive whole institution approach may seem daunting. But you can also view it as empowering. It's possible to start in any area of your museum and make an impact. It's also OK to start small! Choose a project where you can be successful and build on that success.

As you dig into your planning, you'll likely find that many sustainability projects will be related to more than one area in



the model. For example, a museum might provide an afterschool program in partnership with a community organization that helps low-income families, connecting both the education and learning and the community partnerships categories. This example also shows how sustainability efforts can cut across departments and become embedded throughout an organization.

Museum professionals who participated in our research define sustainability in a way that is similar to the UNESCO whole institution model. When asked what role museums and other cultural organizations can play in furthering sustainability, their ideas fell into four categories:

1. Promoting learning and education
2. Acting as a role model for their communities
3. Convening conversations about sustainability topics
4. Building community and collaborations

The next chapters detail each of the four components of the whole institution approach to sustainability. Each chapter provides example projects and provides additional information on particular challenges and considerations for that aspect of museum work.

“This project has opened my eyes to so many areas that the Amarillo community is both excelling in and needs to improve. As a facility, we have taken steps to improve our own sustainability practices, even going so far to have a solar tree donated. With this project, we can educate the public on these practices we are putting into place, and why it has been possible.”

– Jennifer Noble, Don Harrington Discovery Center



QUESTIONS FOR REFLECTION:

1. Does the whole institution model open up new ways of thinking about how you can approach sustainability?
2. Is there one area of this model that is best connected to your work?
3. Is there an area that seems like the most promising place to begin or strengthen your organization's work related to sustainability?

READY-TO-USE RESOURCES

Try these activities to find possible ways to approach sustainability at your organization:

- **Cards for Humanity** game can be played with museum staff and volunteers
- **SDG Brainstorm** worksheet is a systematic tool for identifying ways to incorporate sustainability into all areas of a museum

These tools are available for free download from the NISE Network website. www.nisenet.org/catalog/sustainability-professional-development-resources



EDUCATION AND LEARNING

Education is a key part of the mission of many cultural organizations. As a result, most organizations that are committed to sustainability choose to integrate ideas and skills related to sustainability into their exhibits, programs, and other educational activities. This chapter shares ways that museums can integrate education for sustainability into the opportunities they provide for learning. We share examples of projects that have been inspired by this broad perspective at different organizations and provide practical tips and lessons learned from their experience.

Your organization may already have learning experiences that are focused on topics related to a broad definition of sustainability, such as climate change, nature, or health. You may also have



activities that build 21st-century skills and ways of thinking that are important to education for sustainability. These can be great starting points for expanding or enhancing your public-facing efforts related to sustainability.

Learning goals for sustainability

Education for sustainability is about helping individuals build their skills, increase their knowledge, and draw on their values so they can shape a sustainable future for their community. Some researchers have pointed to specific competencies that sustainability education efforts should seek to cultivate in learners (Wiek et al., 2011). These include being able to consider the interconnections of systems, work with diverse stakeholders, link values to goals, think about the future consequences of actions, and implement sustainability efforts.

“Education for sustainability develops ‘individual and collective potential...to increase the possibility that humans and other life can flourish on Earth now and into the future.’”

– Education for a Sustainable Future, Benchmarks (Cloud et al., 2017)

Museum professionals can use these competencies and ideas to inform sustainability-related education efforts. For example, an activity that explores the connections between growing food and environmental outcomes could help visitors think about the consequences of today’s actions and better understand the connections between food systems and environmental systems. If this activity were implemented in partnership with a food bank or farmers market, it could also highlight how diverse stakeholders can work together to implement sustainability efforts.

CASE STUDY:

Building community capacity for sustainability

Nicole (Colie) Haahr of the Children’s Museum of New Hampshire in Dover took a three-pronged approach for promoting learning about sustainability. She worked with local partners to encourage kids and families to use local trails, started a backpack checkout program with activities for exploring the natural environment, and updated her museum’s *Our Healthy Earth* program.

“There has been a ripple effect with this project, and sustainability efforts at our museum have expanded. We have made changes to our consumption habits, and switched out plastic for paper or wood products in many areas including project supplies and event supplies. We created a sustainability house, which is a doll house with homemade solar panels that kids can add, and garden beds, both highlighting sustainable features of our building. We also plan to add to and expand our Earth Day event, including adding local farms and food as a feature... We created outreach opportunities related to sustainability, and we have been very creative in finding new ways to offer meaningful projects to kids through up-cycling and using what we have.”

– Nicole Haahr, Children’s Museum of New Hampshire

Nicole’s work highlights some key tips for museums looking for ways to start new sustainability efforts:

Start with what you have: It can be easier to adapt or enhance an existing educational program than create a new one from scratch. Nicole found that making sustainability more visible in her organization led to excitement and interest among staff.

Find ways to achieve early success: Partnerships for education can take time, but you can gain momentum by getting small wins early on. Nicole connected with numerous potential partners to find achievable ways to move forward, like asking the City of Dover to provide trail maps for the backpack checkout program.



Global goals for sustainability

The UN Sustainable Development Goals can also inspire a wide range of educational programs for sustainability. By familiarizing yourself with the 17 goals, you might identify a way to link sustainability to existing educational offerings, think of new activities that complement what you have, or even find a way to connect and integrate a constellation of efforts in a way that makes them more impactful.

Some of the SDGs focus on social outcomes (like good health and well-being), while others focus on economic outcomes (like decent work and economic growth) or environmental outcomes (like life on land). Your organization may find some goals fit your mission, priorities, or activities better, and that's OK. You can also use the goals as a framework for your organization's planning about sustainability without explicitly focusing on them in your educational materials.

Inclusive approaches to sustainability

Informal learning settings are great for making difficult topics approachable and understandable for people of all backgrounds. Many museums want to address current science and relevant topics, yet still be inclusive of all members of their local community and ensure that their visitors have a positive experience. With these goals in mind, there are some special considerations when it comes to certain sustainability-related issues, like climate change, that can be controversial.

Here are some tips for tackling sensitive topics:

- **Make them relevant to local communities:** Focus on what people have experienced directly to make these issues easier to

talk about. For example, local extreme weather can serve as an example for the potential impacts of climate change in the future.

- **Lead with areas of agreement and wider support:** Framing issues in terms of common values can avoid unnecessarily polarizing an issue. Everyone may not agree on the causes of climate change, for example, but many people may be supportive of the economic growth that new energy solutions could provide.

Action for sustainability

Many museums encourage visitors to take individual action on sustainability-related issues—such as ways to reduce household food waste or energy use—to empower them to be change agents. While it's true that we can each do our part, it's also important to recognize that addressing some goals will require us to work together. Some sustainability challenges involve changing infrastructure, laws, and organizations. In other words, individual changes are only one part of sustainable change. Addressing systemic problems requires collective actions.

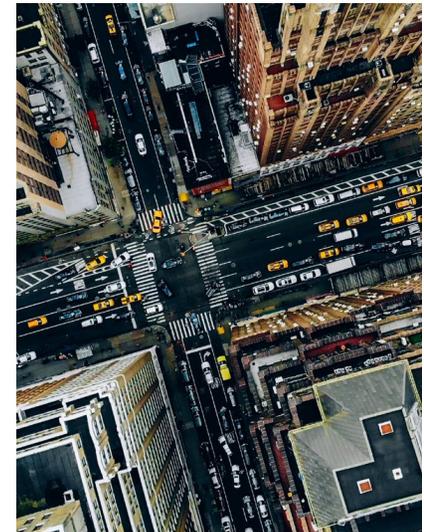
If you're considering offering actions that museum visitors can take, try balancing individual actions (such as driving less often) with messages about ways the community can work together (such as creating bike paths). You can also show the variety of pathways that can get to zero emissions, including individual changes, policy,



pricing, and technology. This helps visitors understand more about our complex world while still providing ways they can create change. This way, you can communicate sustainability challenges as systems challenges and show many pathways for changing, for instance, our transportation or energy systems.

“It’s an easy thing to say, ‘Oh, just don’t shop at the big-box store. Buy from local farms.’ But even for myself, the cost is high. I want to avoid any kind of shaming of people who aren’t able to buy locally grown food. I think it’s that balance of drawing awareness to the problem but also not blaming individual people. If we are talking about agriculture, we should share the systemic issues that make it difficult for people to buy locally.”

– Molly Zegans, formerly of the Maria Mitchell Association



Building a sustainable future requires individual and collective action. We need to make our own sustainable choices every day and work together to create more sustainable communities.



CASE STUDY:

Learning about the global goals

Frank Kusiak at the Lawrence Hall of Science in Berkeley, California, developed a new program inspired by two SDGs, Gender Equality and Climate Action. He created a dialogue-based forum for teens to help them understand the goals, see the relationship between them, and develop their systems-thinking skills.

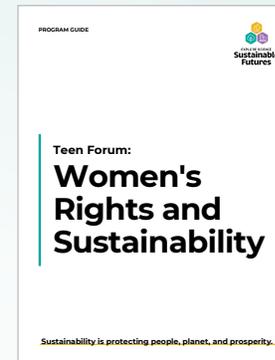
Frank’s program shows how the global goals can inspire meaningful learning.

Connect sustainability to things your community cares about:

Frank knew that the teens who visit his museum care about both social justice and environmental issues, so he created a program that explored the relationship between women’s rights and climate change. This let them learn more about things they care about, in a social and educational setting.

Connect your community to others: Frank made sure his program provided teens with an opportunity to reflect on their own experience, as well as explore gender equality and climate action in a global context.

www.nisenet.org/catalog/womens-rights-and-sustainability



This program gives teens an opportunity to learn how empowering women can also have beneficial environmental and social outcomes.

CASE STUDY:

Co-developing sustainability activities

At the Sciencenter in Ithaca, New York, Peter Leipzig found a creative way to be sure that his sustainability programs would resonate with the local community. He enlisted middle school students who participated in the museum’s Future Science Leaders program to develop sustainability-themed board games that museum visitors could play.

“Informal science institutions can translate information through play. For something that is as important as sustainability, I think it’s great to be able to reach people in a different way, especially people who wouldn’t necessarily be reached through other means of communication.” – Peter Leipzig, Sciencenter, Ithaca, NY

Peter took advantage of an existing youth program to create innovative ways for museum visitors to explore sustainability:

Make sustainability engaging: Peter found that using a game format ensured that learning for and about sustainability was fun and social. Collaborative games are a great match for sustainability because they encourage the skills and thinking that we need to creatively solve important issues.

Make sustainability accessible: Peter points out that museums and similar organizations engage people of all ages, backgrounds, and abilities. It’s important to make education for sustainability cognitively, physically, and culturally accessible to as many people as possible.



SDG board game
go-goals.org



Students at the Sciencenter played existing sustainability-related games prior to creating their own.

QUESTIONS FOR REFLECTION:

1. What opportunities for learning (such as exhibits and programs) do you offer that are related to a broad definition of sustainability? Could sustainability be integrated or highlighted in some of these?
2. Are there local sustainability challenges and solutions you can feature at your organization? Can you spotlight ways your organization is helping to address them?
3. Are there barriers—internal or external to your organization—for incorporating sustainability concepts into your museum’s educational efforts?

READY-TO-USE RESOURCES

NISE Network partners have created hands-on activities and programs that you can use as is or modify to work for you:

- *Games for the Future* activities
- *Watch and Create! Creativity for Sustainability* hands-on activity
- *Survival: A Game Show about People, Planet, and Prosperity* public program
- *Ecosystem Engineers* field trip program
- *Imagine Our Community 2100* forum
- *Women’s Rights and Sustainability* teen forum
- *Good Life Challenge* at-home activity

These tools are available for free download from the NISE Network website. www.nisenet.org/sustainable-futures



FACILITIES AND OPERATIONS

Many cultural organizations are seeking to use energy, water, and materials in a more sustainable way. Some also want to evaluate the social impact of their operations on the communities they serve and act as a model for sustainability. In this chapter, we share resources related to water, energy, and material conservation and reuse, and describe how organizations can promote healthy communities through purchasing and operational changes. We also share examples of projects and strategies for making changes big and small.

A variety of efforts and tools can help your organization operate more sustainably. Finding substitutes for single-use items in programs can lessen the impact of operations and provide teachable

moments for staff and visitors. Energy and water audits can help cultural organizations identify opportunities to reduce waste and save resources. On a bigger scale, organizations participate in national and local programs to reduce the environmental impact of operations, such as the US Green Building Council's Leadership

in Energy and Environmental Design (LEED) program. Professional organizations, such as the Association of Zoos and Aquariums, also provide resources, guides, and information that detail field-specific sustainable operations and practices.

Thinking about sustainability in your organization's operations doesn't have to end at environmental impact. Accessibility, free or reduced entry programs, and the healthiness of food available in your café or vending machines integrate some of the social side of sustainability into your facility's operations.

Does your building or outdoor space include sustainability features? Let your visitors know about your organization's pursuit of sustainable practices.



OMSI in Portland, Oregon, uses sustainable practices through the entire life cycle of their exhibits, from initial conception and design to eventual deaccession and disposal.

Build support across the organization

Making operational and facilities changes requires the cooperation and involvement of many colleagues and departments. For example, conducting a water, energy, or waste audit might include staff involved with facilities, maintenance, and accounting. Audits might also involve people external to your organization, such as your local utility company. In another example, reworking your café or vending machine options to offer healthy choices can affect staff, vendors, purchasing contracts, and museum income.

Building support and plans for sustainable operations across your organization can be challenging, particularly when those plans are perceived as additional work for others. On the other hand, organization-wide initiatives can be an opportunity to get staff across your museum involved.

Find special talent and knowledge

Projects related to facilities and operations may require a lot of expertise. For example, improving the physical accessibility of your facility can be a complex undertaking, and systems for gray water, rainwater harvesting, and renewable energy are not necessarily do-it-yourself projects. Experts, whether from within your organization or from external partners, are invaluable for some projects.

If you don't have the know-how within your own organization, others in your community may be able to help. Some cities have local programs designed to highlight and support sustainable practices within local businesses. For example, the City of Phoenix runs a Green Business Certification program that nonprofits can also participate in. Universities and local business organizations may have programs or classes to support sustainability initiatives such as composting, or they may have staff or researchers who are knowledgeable about sustainability-related practices such as permeable pavements.

Include sustainability in major projects

It can take a lot of time, effort, and money to make changes to your facilities and operations. For example, some changes, like installing a gray water reuse system, might only make sense during other construction. As a result, it's important to incorporate sustainability into major projects. Getting involved with strategic and long-term planning at your organization can help turn ideas for changes into action. (See the next chapter on Policy and Governance.)

CASE STUDY:

Local sustainability programs

Lynnsey Childress at the Discovery Lab in Tulsa, Oklahoma, found a useful sustainability assessment tool called Scor3card that was created by another local organization, Sustainable Tulsa, to help local businesses track and measure sustainability efforts. She plans to use the tool to help make the Tulsa Discovery Lab's operations more sustainable.

“Sustainable Tulsa has a scorecard program, where they will walk us through an assessment of where we are now. Then we can prioritize where we want to go... We don't have to start from square one. We have this system in our community that will even pair us with a mentor to help walk us through this process.”

– Lynnsey Childress, Discovery Lab

Suggestions and takeaways:

Lynnsey discovered that another organization in town was prepared to help her museum create a sustainability plan:

Look for existing tools: Like Lynnsey, you might find resources that are perfect for your use (or that can be adapted to fit your situation).

Search for local partners to help: There may be another organization whose mission is to help other places develop and implement sustainability initiatives. Lynnsey found one to help her museum, and by joining their program, she'll be helping them succeed as well.

CASE STUDY:

Small changes with big impacts

Tiffany Martin at Spark! in Morgantown, West Virginia, worked with her education and outreach team to reduce or eliminate single-use items from hands-on activities.

“This project has created a ripple effect to other areas within the museum when purchasing new materials... We have found ourselves seeking alternatives, or sometimes even asking ourselves if the item is truly necessary.”

– Tiffany Martin, Spark! Imagination and Science Center

Suggestions and takeaways:

Tiffany’s project shows how a relatively small effort can grow and spread to other areas of the museum:

Model sustainable behavior: Tiffany found that once her team began consuming materials more sustainably, others were inspired to join in.

Work with colleagues early to build support for facilities and operational changes: Tiffany got buy-in from others at the museum, contributing to the success of her project.



To minimize waste, the team eliminated many disposable materials from their Forensic Science program. For example, instead of using balloons to record and magnify their fingerprints, students now use a slide and microscope. Remaining consumables are either reduced in size or are take-home materials.

CASE STUDY:

Integrating sustainability into renovations

Emily Landis at the Lancaster Science Factory in Lancaster, Pennsylvania, saw an opportunity to rejuvenate an outdoor space with a local sustainability challenge in mind.

“During our listening phase, we learned about the need to address an urgent local sustainability problem. The City of Lancaster was developing a 20-year plan to address its role as a major polluter of the Chesapeake Bay... Public awareness of this issue is very low. We realized the science center could play a major role in elevating awareness and education. Ultimately, the new outdoor space will include a rain garden, stormwater and solar power exhibits, interpretative signage about the human role in the local and global ecosystem, and murals.”

– Emily Landis, Lancaster Science Factory

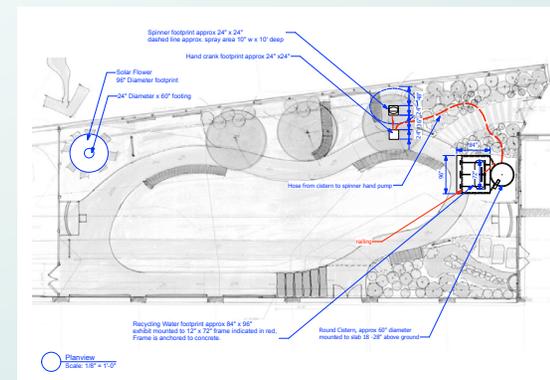
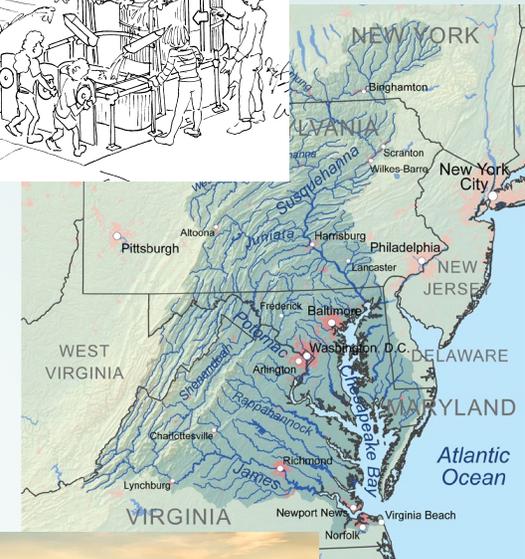
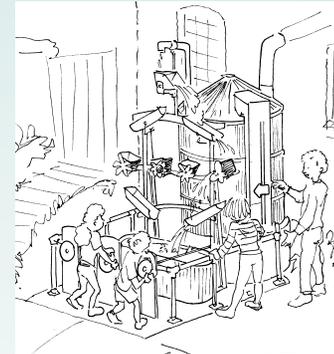
The museum worked with the City of Lancaster’s Bureau of Stormwater Management and the Lancaster Conservancy to focus the project’s message. Emily solicited input from the Chesapeake Bay Foundation, and Pennsylvania College of Art and Design, the local art college, designed interpretative panels. Emily reports, *“It became a very large-scale collaborative effort once we focused on the environmental and sustainability theme, and that’s been a really wonderful outcome.”*

Suggestions and takeaways:

The Lancaster Science Factory integrated sustainability into a planned project:

New construction and renovations are great opportunities to tackle sustainability: Emily was able to address a community-wide issue while simultaneously making needed improvements to the museum’s outdoor space.

Artists, designers, and others can help make sustainability projects special: Emily drew on specialized talent to make the outdoor space visually appealing and educational.



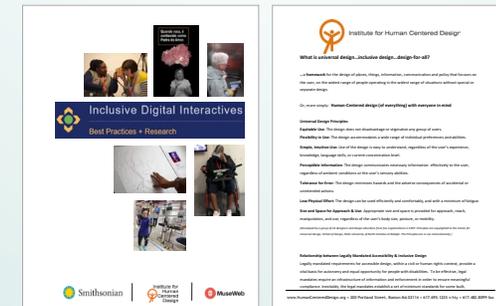
QUESTIONS FOR REFLECTION:

1. What current practices at your museum could be changed to reduce material use or waste? Who else at your organization would you need to work with to implement these changes?
2. What are ways your organization can include some of the social aspects of sustainability in operations?

READY-TO-USE RESOURCES

Some museums and professional associations have already created resources to help cultural organizations make their facilities and operations more sustainable.

- Green Practices from the Association of Zoos & Aquariums:
www.aza.org/green-practices
- ExhibitSEED (Exhibit Social Environmental and Economic Development):
omsi.edu/case-study/exhibitseed
- Resources for accessibility:
access.si.edu/museum-professionals

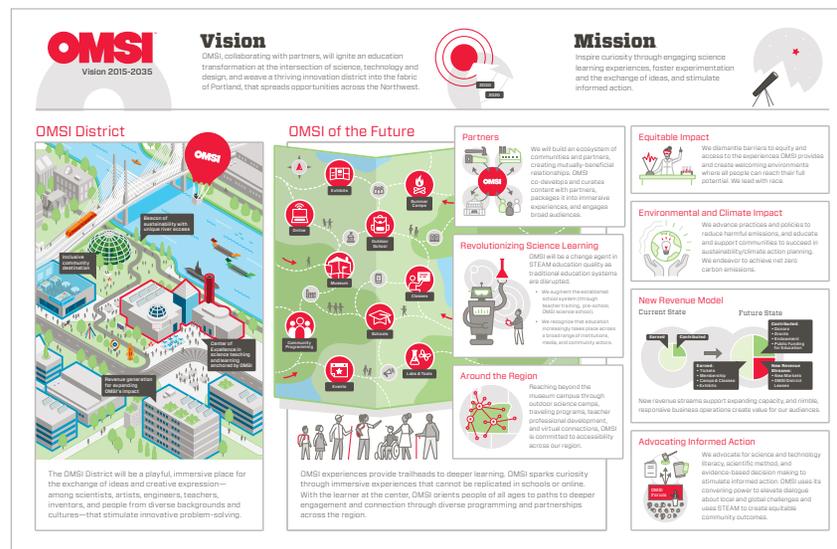


POLICY AND GOVERNANCE

Strategic planning, policies, and collective decision-making can all be part of improving the sustainability of a cultural organization. You may even find ways to share these actions with the public as a way to model sustainability for your community. In this chapter, we discuss ways that sustainability can be incorporated into museum governance. We also share promising practices and ideas for getting others involved and building buy-in. Participants in the Sustainability Fellowship program identified a number of tips for building buy-in and supporting change, and some of the considerations that follow incorporate their findings. Finally, the chapter concludes with an overview of organizational change to help you link these findings to broader strategies for change.

Make the case

Early on, you (and your team) will need to convey the importance of sustainability to others in your organization. Once people recognize sustainability as a worthwhile goal, it's easier to commit to making changes. One way to do this is hold up examples from other respected leaders and organizations in your field or in your local community. National associations of museums, zoos, gardens, and science centers increasingly highlight sustainability-related practices and policies from their member organizations, and these materials can help support your case. For example, Mallory Cotter, an environmental educator, highlighted the increasing importance of sustainability within



OMSI, in Portland, Oregon, incorporated sustainability goals, actions, and principles into their master plan.

national networks of museums, zoos, and gardens in discussions with leadership at her organization, which helped build support for her own sustainability efforts. Similarly, many organizations think it's important to do their part in community-wide sustainability efforts, so sharing the work happening across your community can provide a compelling reason to act.

Incorporate sustainability into planning

Some organizations commit to sustainability as part of their mission or core values and integrate it into their regular strategic and long-term planning. This approach can help to ensure that sustainability is part of all aspects of an organization's work.

CASE STUDY:

Linking sustainability to long-term goals

Kristen Metzger of the Kidspace Children’s Museum in Pasadena, California, created a planning framework to help her and her organization incorporate sustainability. This tool links long-term goals to specific projects, SDGs, and actions.

Kristen developed the framework through regular meetings with the museum’s leadership team. They workshoped the tool to get a sense of what they wanted and how it worked. Their end product identifies a departmental goal and projects that serve that goal, aligns projects with SDGs, outlines the next steps, and articulates areas of support.

“The process of developing the framework allowed us to contextualize existing elements of our work, identified new opportunities, and gave us a way to talk about projects with other staff and in a grant application.”

– Kristen Metzger, Kidspace Children’s Museum

Sustainability Planning Framework

| Long-Term Goal | Projects | Related SDGs | First Steps | Next Steps | Support |
|--------------------------------|------------------------------------------------------|--------------|---------------------------------|--------------------------------|---------------------------------------------------------|
| <i>What we want to achieve</i> | <i>Work that supports the goal (new or existing)</i> | | <i>Next few weeks to months</i> | <i>Next few months to year</i> | <i>Possible or existing partners, grants, resources</i> |

Sustainability framework developed by the Kidspace Children’s Museum

Suggestions and takeaways:

Kristen’s project is a good example of cross-organizational planning:

Define your goals and identify ways to accomplish them: Kristen’s planning tool helped her organization define priorities and projects for sustainability.

Sustainability is related to many key priorities: The Kidspace Children’s Museum was able to align sustainability to many organizational goals and find specific policies and projects to accomplish them.

Integrate sustainability into existing policies and procedures

Incorporating sustainability into existing policies and procedures can help further your sustainability goals. For example, everyday decisions, like the purchase of supplies, are great opportunities to change policies for more sustainable outcomes.

Onboarding processes for new staff or regular staff training sessions are great places to introduce sustainability, and can empower departments across the organization to take sustainable actions. Work with the organizers of those processes to add information and activities about your organization's commitment to sustainability. Educational activities designed for visitors might also work well for staff and volunteer training.

Plan organizational change

Policy and governance for sustainability ties closely with organizational change. Some actions can take place without larger changes to how your organization operates. However, large actions will likely be more successful and long-lasting if they're part of intentional planned change. (*Planned change* is just what it sounds like: change that an organization deliberately sets out to undertake.)

Change can be hard for organizations and the people that work there—and for good reason. Established practices and policies generally work and everyone is familiar with them, making them predictable and reliable. Planned change needs to be undertaken thoughtfully and involve people across an organization.



One useful model for conceptualizing organizational change is based on the work of Kurt Lewin in the 1940s. In this model, the process for planned change happens over three stages:

1. *Unfreezing* current practices and recognizing the need for change
2. *Changing* to new attitudes, values, and behaviors
3. *Refreezing* new practices as the norm

Although organizational change may not be as simple as this model suggests, Lewin's ideas include some helpful insights. First, it's important for people recognize the need for change and be motivated to implement it. In other words, buy-in and intentionality are critical. Second, people and organizations are resistant to change, so leadership and support across an organization are essential. Third, people are the source of learning and change—an organization can only change through the people who work there. And finally, it's important to support new attitudes and behaviors. The work doesn't stop when new practices are identified!

CASE STUDY:

Modifying existing practices to be more sustainable

Chris McAnally of the Royal Botanical Gardens near Toronto, Ontario, saw an opportunity to turn waste into useable products for the gardens. The gardens routinely remove trees due to their age, health, or safety issues. Chris and a team of other staff sought to make sure lumber from those trees could serve a new purpose. The team started a program to mill lumber from trees that required removal, dry it, and repurpose it as material for benches or other uses throughout the gardens. Some of the lumber has already been used by the team to create products for the gift shop, and eventually more lumber will also be shared with local artisans to do the same.

“[At first] there were concerns about the logistics of the project as it falls between departments, and there was no budget to support it. Fortunately, my position has me working between departments often so it fit my role well to coordinate the initiative.”

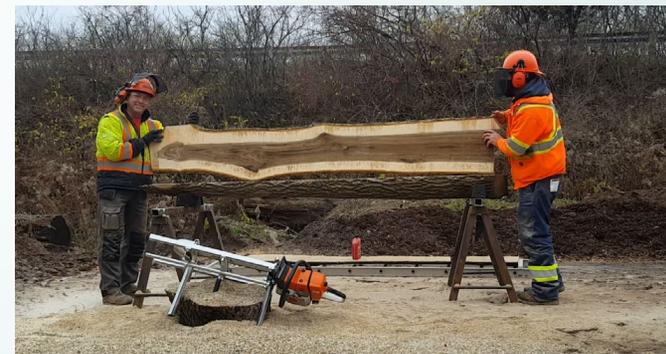
– Chris McAnally, Royal Botanical Gardens

Suggestions and takeaways:

Many people worked together across the organization to make Chris’ project a success:

Work across departments: Chris worked with his organization’s financial, horticulture, and operations departments to build interest and support, and coordinated his efforts to reuse felled trees.

Partner with others in the community: Chris saw an opportunity to both reduce waste and partner with local artisans to create unique items to sell in the garden gift shop.



Change starts when people understand why it's needed. You may want to reference the work of other organizations toward sustainability or highlight a pressing sustainability need in your own community. As you bring others on board, make your team visible and open to collaboration.

New practices develop when people are motivated to change and try new things. As you implement a change, be clear and communicative. Engrained processes in your organization are likely there for a reason. Be empathetic and open to participation to ensure the good things about existing processes are not left behind. Providing training and support across your organization can help facilitate change and make it clear why change is worthwhile.



try to change and reward the attempts they make. Evaluating the impacts of new changes helps build on successes while learning from setbacks.

Reinforce changes for sustainability to make them the new normal. At this stage, resistance to change will be on your side! Once people are used to the new way of working, it will simply be the (new) way things are done. To get to that point, be sure to support people as they

Successful strategies for organizational change

| STARTING CHANGE <i>Unfreezing</i> | DEVELOPING NEW PRACTICES <i>Changing</i> | REINFORCING CHANGE <i>Refreezing</i> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Create a vision and a sense of urgency Create a team that is visible and open Be clear and communicate frequently Gather data and act on it, including concerns and possible solutions | <ul style="list-style-type: none"> Encourage participation across the organization Identify solutions and plan actions collaboratively Implement in a way that is perceived as fair Provide support and training Have respect and empathy for people | <ul style="list-style-type: none"> Evaluate the effectiveness of your efforts Adjust plans and activities as needed Reward attempts at change Build on successes and learn from failures |

Be a change agent

Organizational change requires champions, or *change agents*, who can lead the effort (or parts of it). A change agent doesn't have to be in the upper level of organization hierarchy: anyone who has the skill and power to stimulate, facilitate, and/or coordinate the work can take on that role. The table above provides some tips for acting as a change agent within your organization.

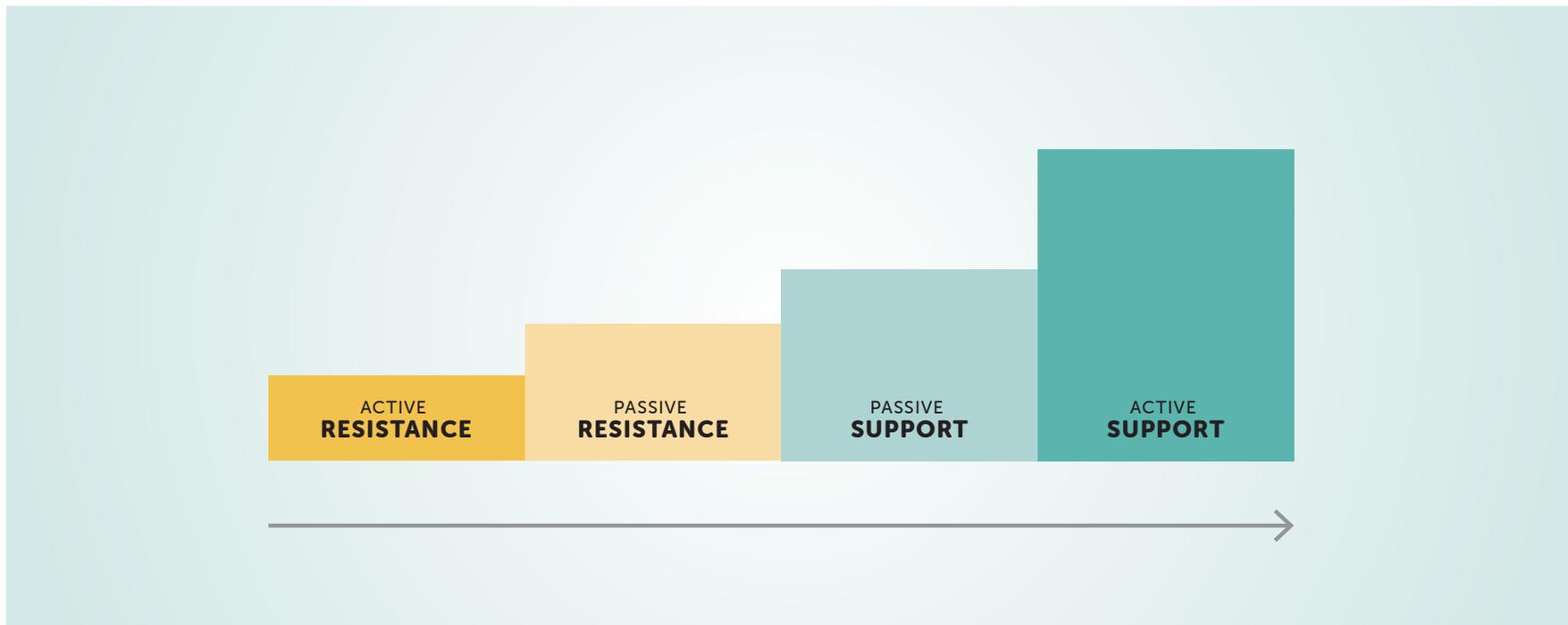
Create a team and a process for involving others

Sustainability projects and policies often require collaboration with others at your organization. People at your organization will have a variety of reactions to possible changes related to sustainability. Colleagues might be excited to help, they might be generally supportive but feel their hands are already full, or they might be skeptical.

Take a look at the following diagram. One way to think about the process of building buy-in is to visualize moving everyone in your organization over one position. Start by getting commitment from people who are already active supporters, and see if you can convert people who are passive supporters to being more active. For example, a couple people might like the idea of a new sustainability-themed program at your organization but may not be involved. Getting them involved with the planning and implementation of the effort creates more voices actively supportive of the program. Next, see if you can get people who are passive resisters to be passive supporters, and get

your active resisters to be passive. This may be easier to do when you have evidence that your new ideas can work, so try to get some early successes, even if they're small.

Building support across your organization can take time and effort. Consider starting a green team or a sustainability group that invites others to help plan and undertake sustainability efforts. Such a team should meet regularly, collaboratively define shared goals, and include a diversity of departments and perspectives to help build a better program and broad support.



People will have many reactions to proposed changes. Through time, your goal is to get as many people as possible to actively support change, and as few people as possible to actively resist change.

QUESTIONS FOR REFLECTION:

1. Are there existing planning processes or groups that could take on sustainability, within a department or across your organization? Or would a dedicated sustainability planning team make sense?
2. Who at your organization might be an active supporter of sustainability efforts, or essential to accomplishing sustainability goals? Are there ways you can involve them?
3. What opportunities exist to bring others on board? Are there staff and volunteer trainings that would welcome sustainability content?
4. Meet with other departments at your organization to identify opportunities to improve the well-being of your community and the environment. In addition to your physical environment, don't forget to consider policies such as purchasing.

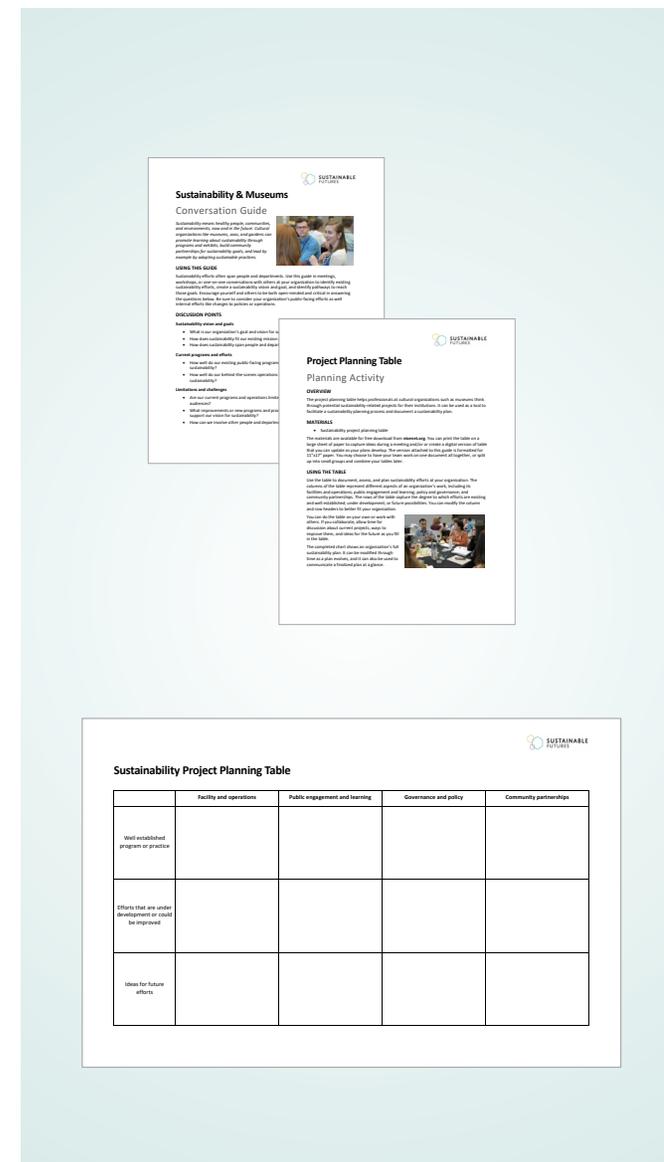
READY-TO-USE RESOURCES

Try these NISE Network activities to identify ways to approach sustainability at your organization:

- **Conversation Guide** to help you get started with sustainability planning
- **Planning Table** to assess your organization's current sustainability efforts and organize future ideas for sustainability-related projects

These tools are available for free download from the NISE Network website.

www.nisenet.org/catalog/sustainability-professional-development-resources



COMMUNITY PARTNERSHIPS

Museums can work with many other organizations in their sustainability efforts, whether these are behind the scenes or public-facing. Nonprofits, universities, city governments, businesses, and community members bring valuable skills, abilities, and capacities to sustainability efforts. Partnerships can expand the impact of a sustainability project or take a project in new directions. Partnerships can also create local networks for sustainability that allow for the strength of different people and organizations to build on each other. For example, working with another organization can help you engage groups that don't tend to visit the museum and expand your current programs.

Creating partnerships takes time and effort. This chapter outlines some important steps you can take to ensure your partnerships are successful and provides suggestions for responding to some common challenges.

Building partnerships

Many participants in the Sustainability Fellowship program established partnerships with other organizations to accomplish their projects. While these were worthwhile, museums did encounter challenges building partnerships, including mismatched goals and difficulties with communication. Different organizations and individuals may approach a partnership for sustainability from different perspectives.



Partnerships can create mutually beneficial relationships to advance sustainability for an entire community. At the Museum of Life and Science in North Carolina, Max Cawley and Tomara Gee worked with Raleigh city planners to create a forum activity that asks participants to think through what they want their community to look like in 2100.

The [NISE Network collaboration guide](#) can help inform strategies for your organization. Key points from that guide include:

- Spend time to get to know potential partners.
- Identify your goals early on. Be clear about what you want to accomplish.
- Start small to develop trust.
- Create a feasible timeline for your joint work.
- Keep open lines of communication.
- Incorporate evaluation or a debrief so you can learn from the process.



CASE STUDY: Finding win-win opportunities

Consider what capacities, knowledge, and other resources you might bring to a partnership as well as what capacities potential partners may bring. Kasi Gaarenstroom at the Museum of Pop Culture in Seattle, Washington, invited local environmental groups, such as 350 Seattle and ZeroHour, to share advocacy information during a climate change-themed movie series held at the museum.

CASE STUDY: Recognizing common goals

Niles Parker at the Maine Discovery Museum in Bangor recognized that the museum, the Maine Audubon, and the Hirundo Wildlife Refuge shared a similar goal: helping members of their community learn about the natural world. Niles' original idea for a collaboration among the three organizations was to "bring these groups together to leverage their work and shine a brighter spotlight, collectively, onto that work." Ultimately, this collaboration led to the development of a podcast about sustainability-related work taking place at each organization.

Strengthening partnerships

Trust, reciprocity, and experience are all important for building partnerships. Play the long game by building relationships with many potential partners so you (and your partners) can take action when opportunities arise. Connecting with other organizations and people in your community who are interested in sustainability helps lay the groundwork for productive partnerships in the future.

Think through what partnerships would be helpful for your organization's sustainability priorities. What projects align with the goals of potential partners? A specific project might lead you to seek out a new partnership, or you might get to know another organization for a while before an opportunity to work together emerges. Long-term partnerships may develop over more than one project.



CASE STUDY:

Bridging personal and professional networks

Anjuli Grantham at the Alaska State Museum in Juneau has long had a personal interest in sustainability related to her concern about the state's exposure to the impacts of climate change. Outside her role with the museum, she volunteered with other organizations focused on sustainability. Those connections paid off when she wanted to create a network of electric vehicle charging stations at museums across the state. She partnered with the Alaska Electric Vehicle Association to encourage museums to host electric vehicle charging stations and share information about electric vehicles.

"I have this broader network in the sustainability world, including a lot of people that are engaged in trying to grow EV use in Alaska. I realized I was in a pretty unique position to be a nexus between those who are involved in the EV community and then the broader museum community in Alaska."

– Anjuli Grantham, Alaska State Museum

Suggestions and takeaways:

Anjuli leveraged her personal network to tackle an ambitious project that met community needs and helped her organization accomplish its mission:

Consider the needs and priorities of your community: The effects of climate change are already apparent in Alaska, but there were few charging stations to encourage residents to invest in electric vehicles. Anjuli's project addressed this need.

Your own networks, strengths, and experiences can help you find opportunities for partnerships: To create an impactful project for her organization, Anjuli pursued a project that drew on her personal interests and connections.



CASE STUDY:

Engaging students and experts

At the Evergreen Aviation and Space Museum in McMinnville, Oregon, Kathryn Sinor wanted to connect the museum's focus on space with sustainability efforts. She decided to create a space garden: a garden system that mimicked the soils of the moon, Mars, and Earth and grew the plants that NASA saw as promising to sustain life off Earth. She also wanted to engage the local community and students with space science. She partnered with local schools and universities to involve students in the design and construction of the garden and the hydroponic and aeroponic growing systems.

"We involved students in the entire process, brainstorming ideas together, building the systems together, and allowing the project to morph as we all collaborated. Through the students, we also made some great connections with other professionals: botanists who were interested in the project and an architect."

– Kathryn Sinor, Evergreen Aviation and Space Museum

Suggestions and takeaways:

Kathryn's project attracted support from across the community:

Many people are willing to share their time and talents: Kathryn's project was interesting and fun, so students and professionals were excited to pitch in to make the space garden a reality.

Involve partners in all stages of a project: Kathryn included students and volunteers in all aspects of the project, allowing them to become invested and take ownership in the project. This made an ambitious undertaking possible.



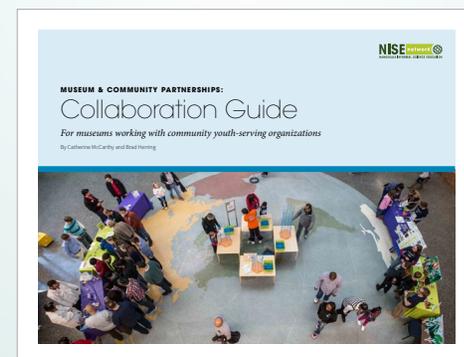
QUESTIONS FOR REFLECTION:

1. What groups, people, or organizations in your community could you partner with for sustainability efforts? Do you already have a relationship with these potential partners?
2. Write down a few sustainability efforts you'd like to undertake. For each, list a potential partner that could complement or contribute to that effort. If you don't know of a potential partner for each idea, spend a few minutes searching for organizations or people that might be a good fit.
3. For each potential partner you've listed from questions 1 and 2, write down what their sustainability-related goals might be and how your organization can help them achieve those goals.

READY-TO-USE RESOURCES

The NISE Network developed a **Collaboration Guide** to help museums create partnerships with youth-serving community organizations, but it has many useful tips, templates, and strategies for building museums with a variety of community partners.

www.nisenet.org/museum-community-partnerships



FUTURE DIRECTIONS

Sustainability is a big and increasingly important topic for cultural organizations and museums. In the Sustainability Fellowship program, many museum professionals agree that a good first step for sustainability at their organizations was defining clear goals for their work. As shown above, a diversity of projects, efforts, and ideas can fit into the category of sustainability projects at cultural organizations. Breaking sustainability down into smaller pieces and projects helped fellows work through the complexities of sustainability. You can work with others at your organization to lay out clear, achievable goals related to sustainability. You can also look at other existing or planned efforts to identify a relationship to sustainability.

Even with clear goals, some sustainability concepts and projects pose challenges for museums. For example, some sustainability solutions go beyond individuals and require global cooperation or changes to important infrastructural systems we use every day. How can museums help visitors understand the broader systems important to sustainability? And how can museums take a role in addressing societal and systemic change? Some museum professionals find it difficult to advocate for specific community actions and policies for sustainability due to their organization's role as a trusted, neutral space for learning about science.

These challenges suggest three pathways to help museums and other cultural organizations address sustainability:

1. Develop new ways to support learning about interconnected social, ecological, and technological systems. The field needs better ways of conveying how systems work and the ways they can

change. The intricacies of policy, technology, behaviors, and our natural world make sustainability problems like climate change difficult to clearly communicate, let alone solve. Museums can create evidence-based approaches to help people throughout a community understand how societies change and contribute to the kinds of transformations they envision.

2. Understand how and why museums can influence change for sustainability in their community. This work would allow museums to have a greater role in building a sustainable future, and serve as a model for other types of community organizations. It would also include the barriers—real and perceived—for museums to take on advocacy work, as well as the pathways museums can legitimately use for advocacy (such as partnering with other organizations).



3. Partner with local governments on sustainability projects. Few of the participants in the fellowship program worked with government partners, yet city, county, and other local governments often craft policy and run programs directly related to sustainability goals. Those museums who did partner with local governments

found the experience valuable and beneficial, suggesting that this is a potentially impactful approach. Museums are able to translate complex topics into accessible and fun activities that can be directly connected to sustainability planning and policies, while local governments run various programs that can help museums improve operations (e.g., composting and recycling) and reach broader audiences (e.g., human services).

ADDITIONAL RESOURCES

Tools, guides, and other resources from NISE Network

Here are some selected tools and resources from the NISE Network you can use to get started at your organization. All are available from NISE Network's website.

www.nisenet.org/catalog/sustainability-professional-development-resources

Conversation Guide. This conversation guide can help you discuss sustainability with others at your organization.

SDG Brainstorm. This activity is useful for thinking of existing and new efforts at your organization related to each of the UN Sustainable Development Goals.

Impact-Resources Chart. Weigh the anticipated impacts and required resources of potential projects with this tool.

Planning Table. Use this table, developed by Nicole Haahr of the Children's Museum of New Hampshire, to assess your organization's current sustainability efforts and organize future ideas for sustainability-related projects.

Logic Model. Once you've decided on a project, this guide and included worksheets can help link your goals to short- and long-term actions for success.

Tools, guides, and resources from other organizations

SUSTAINABILITY AND MUSEUMS

- **The Cloud Institute** has a variety of frameworks, activities, and curricula focused on education for sustainability.
cloudinstitute.org/cloud-publications
- More about the **UN Sustainable Development Goals** is available from the United Nations. In particular, the Good Life Goals were developed to be a more approachable version of the SDGs for younger audiences. sdgs.un.org/goals
- UNESCO's **Education for Sustainable Development Goals** report is a useful resource for thinking about education and sustainability.
unesdoc.unesco.org/ark:/48223/pf0000247444

EDUCATION AND LEARNING

- **The Frameworks Institute** and the **National Network for Ocean and Climate Change Interpretation (NNOCCI)** developed an evidenced-based approach to promoting learning in visitors about climate change and related environmental challenges.
www.frameworksinstitute.org/issues/climate-change-and-environment
climateinterpreter.org/about/projects/NNOCCI
- Several sustainability scholars, led by Arnim Wiek, wrote a useful **framework for thinking about capacities for sustainability**.
link.springer.com/article/10.1007/s11625-011-0132-6

FACILITIES AND OPERATIONS

- The Association of Zoos & Aquariums created two volumes on green practices for cultural organizations.
www.aza.org/green-practices

- The U.S. Green Building Council’s Leadership in Energy & Environmental Design (LEED) program includes a certification program and best practices for improving operations.
leed.usgbc.org
- The Oregon Museum of Science and Industry (OMSI) created a **Green Exhibit Checklist** to help evaluate the environmental impacts of museum exhibits. omsi.edu/sites/default/files/ExhibitSEED_Green%20Exhibit%20Checklist.pdf

POLICY AND GOVERNANCE

- OMSI’s Master Plan is a good example of the ways that sustainability can be incorporated into long-term planning.
omsi.edu/sites/default/files/u92/OMSI%20Master%20Plan%20%28as%20of%2017.09.28%29.compressed_v2.pdf
- The Canadian Museum Association created a brief resource for conducting responsible procurement.
www.museums.ca/document/1147/Chapter_7.pdf
- A more detailed resource for thinking through more sustainable procurement policies can be found at www.naspo.org/green-purchasing-guide from the National Association of State Procurement Officials.

COMMUNITY PARTNERSHIPS

- The NISE Network developed a guide to help museums create partnerships with youth-serving community organizations, but it has many useful tips, templates, and strategies for building museums with a variety of community partners.
www.nisenet.org/museum-community-partnerships

REFERENCES CITED

United Nations General Assembly, and World Commission on Environment. *Our Common Future*. (1987). <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

Australian Curriculum, Assessment and Reporting Authority. (n.d.). Australian curriculum for sustainability. <https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/sustainability/>.

Cloud, J.P., ed. (2017). Education for a sustainable future: Benchmarks for individual and social learning. *Journal of Sustainability Education* (2017), 1–66.

United Nations. (2015). *Global sustainable development report*. <https://sustainabledevelopment.un.org/globalsdreport/2015>.

Wiek, A., Withycombe, L., & Redman, C.L. (2011, July). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science* 6(2): 203–18. <https://doi.org/10.1007/s11625-011-0132-6>.