PORTAL TO THE PUBLIC

IMPLEMENTATION MANUAL & CATALOG OF PROFESSIONAL DEVELOPMENT ELEMENTS

PORTAL to the Public

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TABLE OF CONTENTS

The Portal to the Public Implementation Manual and Catalog of Professional Development Elements have been optimized for use on digital devices. We recommend that you use Adobe Acrobat or Adobe Reader for best results. Items listed in the Table of Contents and written in blue text are hyperlinks. For easy navigation, open Acrobat's Bookmark feature.

iii Table of Contents
vi Acknowledgements
vii Welcome

Portal to the Public Implementation Manual

9 INTRODUCTION
10 What is Portal to the Public?
11 How to Use this Manual
12 Additional Resources
13 Why Begin with Reflection?
14 Building a Reflective Practice

15 CHAPTER 1: THE GUIDING FRAMEWORK
16 Why Bother with Face-to-Face Interactions?
17 The Portal to the Public Guiding Framework
19 Birds of a Feather: Common Assets and Challenges of Organization-Types within Portal to the Public

26 CHAPTER 2: CONCEPTUAL PLANNING
27 The Purpose of Planning
28 Phase 1: Taking a Self-Inventory
29 Phase 2: Defining Desired Impacts
30 Phase 3: Program Design
32 Phase 4: Anticipating Potential Hurdles and Identifying Strategies For Sustainability
33 Building Internal Support
34 Putting it Down on Paper
35 Sample Conceptual Plans

41 CHAPTER 3: PARTNERSHIP AND RELATIONSHIP BUILDING
42 Choosing Partners
43 Nurturing Relationships
44 Partner Motivations
45 Recruiting Strategies
47 Communication Strategies
48 Recognition and Appreciation

50 CHAPTER 4: PROFESSIONAL DEVELOPMENT
51 The Portal to the Public Approach to Professional Development
52 Overview of Professional Development Objectives and Resources
53 Professional Development Formats and Structures
55 Mentorship and Activity Development
56 Facilitating Excellent Experiences
58 Tips for Smooth Operations

61 CHAPTER 5: PUBLIC PROGRAMS
62 Face-to-Face Interactions
63 Program Planning
65 Operations and Logistics
66 Promotional Strategies
67 A Cycle of Growth

70 CHAPTER 6: ORGANIZATIONAL SUSTAINABILITY
71 Why Sustainability Matters
72 Attitudinal Sustainability
73 Programmatic Sustainability
74 Financial Sustainability
75 Putting it All Together
76 Evaluation

80 CHAPTER 7: CASE STUDIES
81 Introduction
82 Sunset Zoo
85 The Oregon Museum of Science and Industry (OMSI)
88 University of North Carolina Morehead Planetarium and Science Center

Appendicies

92 How to Use the Appendices

93 APPENDIX A: USEFUL RESOURCES

94 References
95 Conceptual Planning Worksheet: Phases 1 and 2
96 Conceptual Planning Worksheet: Phases 3 and 4
98 Guiding Framework Template
99 Portal to the Public: Boilerplate Language
100 Map of PoPNet as of 2018

101 APPENDIX B: PARTNERSHIP AND RECRUITING DOCUMENTS

102 Recruiting Flyer
103 Letter of Support for Broader Impacts Project
104 Informational Letter for Wisconsin IDEA STEM Fellows
106 Recruiting Flyer for *Engineer It!*
108 MOU Template
109 Simple Application for Science Communication Fellowship
110 Application for Science Communication Fellowship
112 Notification of Acceptance
113 Certificate of Completion
114 Letter of Appreciation to a Scientist
115 Letter of Appreciation to a Scientist's Supervisor

116 APPENDIX C: PUBLIC PROGRAMS DOCUMENTS

117 Large-Scale Event Info Sheet for Participants
118 Scientist Expo Presentation Sign-Up
119 Simple Registration Form for Large-Scale Event
120 Public Program Checklist
121 Scientist Expo Workflow
126 Tabletop Activity Description
127 Photo Release and Photo-Taking Protocol
128 Guidelines for Running a Public Outreach Event with a Partner
129 Activity Plan Worksheet

132 APPENDIX D: MARKETING MATERIALS

133 Press Release
135 Press Release
136 Press Release
138 Newsletter Article
139 Onsite Signage
140 Onsite Signage
141 *Behind the Science* Marketing Postcard
142 Social Media Posts

143 APPENDIX E: EVALUATION INSTRUMENTS

144 Evaluation Action Plan Worksheet
145 Generic Workshop Evaluation Form
147 Workshop Evaluation Survey
149 Exploration Station Evaluation Form
150 Post-Public Event Evaluation Form for Scientists
152 Public Program Survey for Attendees

154 APPENDIX F: FINANCIAL MODELS AND SUSTAINABILITY DOCUMENTS

155 Scientist Partner Motivations with Examples
156 Sponsorship Opportunities for Current Science Programs
157 Project Report
159 Project Report

Catalog of Professional Development Elements

161 How to Use the Professional Development Elements

163 SECTION 1: HOW PEOPLE LEARN

164 Making Meaning
168 Personal Learning
173 Building a Common Vision
181 The Pleasure of Finding Things Out
185 Discovery on the Exhibit Floor
187 Learning Through Play
191 What's Your Schema?
195 Experiencing Discrepant Events

200 SECTION 2: ACTIVITY AND MATERIALS DEVELOPMENT

201 Activity Showcase
203 Materials Development for Portal to the Public Programs
206 Scientist Interview and One-on-One Activity Support
210 Three Looks: Table Aesthetics
214 Prototype Rotation

218 SECTION 3: FACILITATION

219 Critique of Scientist Video Presentations
220 Facilitation Strategies on the Exhibit Floor
224 Invitations to Participate
231 Questioning Strategies
236 What's in a Word?
240 Conversations About Values
249 Talk With Your Neighbor

253 SECTION 4: REFLECTION

254 Concept Mapping
257 Scientists Find Their Stories
261 Points of Connection
268 Why, Why, Why?
271 Aligning Goals and Audience
275 Gauging Success Using Rubrics
284 Reflective Facilitation

287 SUPPLEMENTAL INFORMATION

288 Sample Professional Development Experience Agendas
292 Professional Development Elements At-a-Glance

ACKNOWLEDGEMENTS

This updated version of the Portal to the Public Implementation Manual incorporates some of what we have learned in the years since the Manual's initial publication. The core of the approach—the structure of the framework, the commitment to face-to-face interactions, and the focus on reflective practice—remains the same. We are grateful to the many people who have contributed to this work over the years, from those who attended the very first Synthesis Meetings, to those who helped copyedit and lay out this updated document.

Standing on the shoulders of giants…

Since so much of this updated Manual is consistent with the original we would like to extend our thanks to Lauren Moreno and Kristin Leigh, who took on the bulk of the writing, and to Meena Selvakumar, Dana Vukajlovich, Lauren Burman and Wendy Hanson who each contributed to the original document in significant ways. We would like to thank all of the staff at Pacific Science Center, Explora, and the North Museum of Natural History and Science who provided input in the early stages, and to Jennifer Prichard and others at Pacific Science Center who helped guide the growth of the Portal to the Public community. Thanks to the research and evaluation team—Martin Storksdieck, Jessica Sickler, Susan Foutz, Angie Ong and Carey Tisdal—who offered insights that helped guide the construction of the framework.

In this updated version, we incorporated many new voices, and revisited some who have long been involved with the project. Thank you to the incredible attendees at our 2017 Synthesis meeting in Nashville, TN. Thanks to Jared Bixby, Amy Miller, Stacey Forsyth, Becky Wolfe, Travis Tangen, Katey Ahmann, Karlisa Callwood and Mandy Bobrow, and to the many other members of the Portal to the Public community who contributed in various ways. Thank you to our research and evaluation partners, Catharine Stylinski for joining our evaluation work and to Martin Storksdieck and Jessica Sickler for their continued efforts. A huge thank you to Carolina Chambers for her hard work on this project, and to Justin Allan-Spencer for bringing it all together so beautifully.

We are endlessly grateful to the Institute of Museum and Library Services and to the National Science Foundation (NSF) who have each supported the growth of Portal to the Public over time. Thanks to NSF in particular for recognizing the value of this opportunity to capture many years of lessons learned.

Finally, we wish to thank Dennis Schatz, who was the initial driving force behind this project, and has continued to be a guiding light for all of us working across a range of fields that aim to support public engagement with science. Anyone who has worked with Dennis knows his uncanny ability to help the rest of us do our very best work. Thank you, Dennis, for all you have done and all you continue to do!

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WELCOME

Portal to the Public was originally funded by the National Science Foundation (NSF) in 2007, the same year that the Center for Advancement of Informal Science Education (CAISE), the resource center that I now direct, was established. At the time, informal STEM learning was already well recognized as a professional field by the NSF and others. These groups provided support for efforts to create infrastructure that would connect the wide variety of institutions, organizations, and individuals that were working to design, implement, and study informal science education (ISE) experiences for people of all ages.

In that era, when members of the scientific community sought to engage with the public, they often partnered with learning and cultural organizations on an ad-hoc basis. The outcomes of these efforts varied significantly. The originators of the Portal to the Public project helped transform the landscape by embracing an iterative, evidence-based approach to program design and communication training. Today there are a wide range of structured and thoughtful support systems for STEM-based professionals who seek to improve or increase their public engagement activities.

Portal to the Public's approach from the beginning has been responsive, practical, and grounded in experience, and the Implementation Manual first produced in 2012 was a reflection of this. Since 2012, the range of institutions using the Portal to the Public approach has expanded to include zoos, aquaria, botanical gardens, research centers, and university outreach departments. The knowledge gained through this growth has informed this rich new version, which reflects the nuances of face-to-face encounters between scientists and a diversity of audiences in these various settings.

As I write this in 2018, the adjacent fields of ISE, science communication, public engagement with science, and broader impacts are increasingly finding synergy as they address the common challenges of integrating research and practice, evaluating impact, and broadening the participation of underrepresented groups in their activities and professions. The new Portal to the Public Implementation Manual is a timely, useful resource to inform and support these efforts and one that I hope will be widely disseminated.

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of Informal Science Education (CAISE)

PORTAL TO THE PUBLIC
IMPLEMENTATION MANUAL

PORTAL
to the Public

INTRODUCTION

10 What is Portal to the Public?

11 How to Use this Manual

12 Additional Resources

13 Why Begin with Reflection?

14 Building a Reflective Practice

INTRODUCTION

What is Portal to the Public?

Portal to the Public is an approach designed to help informal science education (ISE) organizations connect public audiences with the scientists working in their communities, through face-to-face interactions at public programs and events. The hallmark of the approach is a flexible guiding framework that gives ISE organizations the ability to design and scale specific strategies to fit their own specific goals. Individual Portal to the Public programs have measurable impacts on public audiences, participating scientists, and on their own organizations.

The framework focuses on three key components:

1. **Building relationships** between ISE staff and the scientists and science-based organizations in their community
2. **Professional development** that prepares scientists to have conversations about their work in informal learning environments
3. **Public programs** that feature face-to-face interactions with scientists

The Portal to the Public guiding framework was developed under a three-year National Science Foundation (NSF) grant, awarded in July 2007. Led by Pacific Science Center (Seattle, WA), the project development team included two additional museum partners, Explora (Albuquerque, NM), and North Museum of Natural History and Science (Lancaster, PA). In addition, the Institute for Learning Innovation conducted research and formative evaluation, and Tisdal Consulting led the summative evaluation.

This team designed, tested, evaluated, and refined a diverse array of strategies, approaches, and program formats related to the three key areas of the guiding framework.

Subsequent funding from the Institute of Museum and Library Services (IMLS) and a second NSF award supported further growth and expansion of the community of organizations that use the Portal to the Public guiding framework. Collectively, this community makes up the Portal to the Public Network. Originally focused on science museums, the Network has expanded to include zoos, aquariums, natural history museums, botanical gardens, research centers, and university groups. As of February 2018, 60 organizations across North America have worked with the Portal to the Public team to develop a comprehensive plan for integrating the guiding framework into their operations. Many others have adopted components of the framework independently.

Throughout this manual, you will read case studies from many of the Portal to the Public sites. While new organizations need not replicate these original approaches, the processes, successes, and failures from these sites may provide valuable ideas and insights.

How to Use this Manual

This manual is a tool for organizations that plan to design and implement a project based on the Portal to the Public guiding framework. It addresses the most critical elements required for successful face-to-face interactions between scientists and public audiences, and shares insights from the experiences of other organizations that have already gone through the implementation process. The order of the chapters generally describes the order in which you will likely plan and implement your Portal to the Public project. A brief overview of the manual's content is as follows.

Chapter 1: The Guiding Framework

The Portal to the Public guiding framework is the structured set of concepts from which an ISE organization will develop its own unique project to bring scientists and public audiences together for face-to-face interactions. Although all Portal to the Public efforts share certain features, each organization brings its own set of assets and challenges that should be considered prior to beginning a new project. This chapter provides an overview of the framework, and looks at the many different types of ISE organizations that have adopted it successfully.

Chapter 2: Conceptual Planning

Conceptual planning allows ISE staff to think through and develop an actionable plan for their organization's unique Portal to the Public project. Strong conceptual plans are grounded in an organization's strengths, values, and desired impacts for the project. This chapter guides organizations through the conceptual planning process in four phases:

1. Taking an organizational self-inventory
2. Defining desired impacts
3. Program design
4. Anticipating potential hurdles and identifying strategies for sustainability

Project staff should revisit and update their organization's conceptual plan often.

Chapter 3: Partnership and Relationship Building

Identifying partners and building relationships can take time, but strong partnerships are a critical foundation for all Portal to the Public efforts. By working to understand a partner's motivations and needs, ISE staff can design a program that is both appealing and rewarding to potential participants. This chapter provides guidance on selecting partners, initiating and building a robust working relationship, and maintaining the relationship over time.

Chapter 4: Professional Development

Portal to the Public professional development prepares scientists to engage in face-to-face conversations with public audiences about their own scientific work. Professional development experiences can take the form of workshops, one-on-one meetings, or a combination, and the specific activities selected should support an organization's overall desired impacts. This chapter looks at strategies for supporting scientists in professional development. "The Catalog of Professional Development Elements" at the end of this manual includes step-by-step instructions for 27 activities and sample workshop agendas from Portal to the Public sites.

Chapter 5: Public Programs

For public audiences, Portal to the Public public programs and events provide an opportunity to meet the scientists working in their communities. For scientists, access to thoughtfully structured and carefully organized events can have a significant impact on rates of participation and feelings of success in conducting outreach. This chapter outlines some key considerations that should inform public program design.

Chapter 6: Organizational Sustainability

To increase the likelihood of sustainability, Portal to the Public project staff must take a long-term view from the very beginning of the conceptual planning process. This chapter addresses three, interrelated dimensions of sustainability: attitudinal, programmatic, and financial. A focus on these three dimensions, along with thoughtful evaluation of a program's real impacts, creates a strong basis for a durable, lasting project.

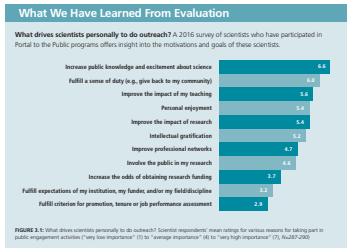
Chapter 7: Case Studies

This chapter shares the experiences of three diverse Portal to the Public programs, describing how they have grown and morphed over time.

Additional Resources

Within the seven core chapters of this manual, you will find space for notes and reflections, as well as perspectives from individual institutions. Following the chapters, there is a set of appendices containing items such as planning documents and program materials, and the "Catalog of Professional Development Elements."

What We Have Learned From Evaluation



Significant evaluation has been conducted over the past ten years on the Portal to the Public approach and how it impacts participating scientists, public program attendees, and ISE staff and organizations. These sections describe some of the most relevant findings that may help you as you plan for your own Portal to the Public project.

Take Time to Reflect

As described below, reflection is an essential component of implementing a Portal to the Public project. These sections, toward the end of most chapters within this manual, suggest questions for project teams to consider after completion of each major phase of a Portal to the Public project.

Take Time to Reflect

After you have implemented your first round of Portal to the Public programming, take time to think about your experiences. Consider the questions below (and add your own), as you reflect on your progress and make future plans.How has your institutional and personal capacity grown in terms of initiating partnerships and/or developing relationships with scientists and science organizations?

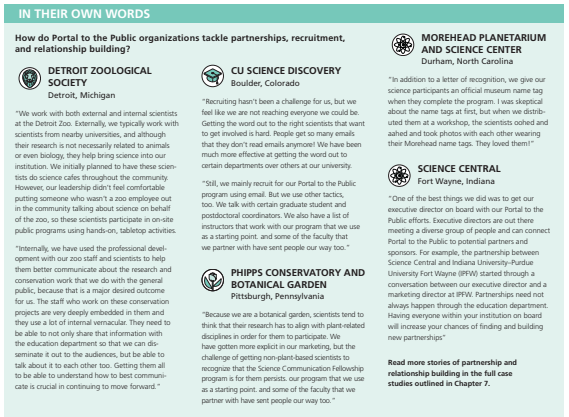
1. How have your existing relationships with participating scientists, science-based organizations, and amongst your own staff changed as a result of your first round of programs?
2. What strategies will you add or change in your next round of programs?

Scientist Spotlight

These sections highlight the experiences and perspectives of scientists who have participated in Portal to the Public projects at a variety of sites.

In Their Own Words

This section, at the end of each chapter, describes how staff at Portal to the Public sites have implemented and adapted the key components of the Portal to the Public guiding framework and other lessons learned throughout the process.



Appendices

The appendices include a variety of helpful materials from Portal to the Public sites, such as planning documents, evaluation instruments, and program outlines. There are also examples of recruiting materials, logistics forms and checklists, and sample marketing materials.

Catalog of Professional Development Elements

The "Catalog of Professional Development Elements" was designed to be used in conjunction with the rest of the "Implementation Manual." The catalog is a practical guide to creating and facilitating professional development experiences for scientists.

Many professional development elements contain worksheets and handouts which can be reproduced. Look for pages with these special permissions as you explore the catalog.

Why Begin with Reflection?

Experience with dozens of organizations suggests that reflection is essential to the success of a high-investment project like Portal to the Public. Because the Portal to the Public Guiding Framework is flexible, instead of prescriptive, it will take thought, time, and experimentation to find the precise approaches that work best for your organization. Furthermore, how you implement your Portal to the Public project will change over time, as your organization's goals and priorities change, or external factors require redirection.

Reflection is the tool that can support your efforts during initial implementation and through periods of growth and change. Coupled with evaluation, thoughtful reflection can help you improve the professional development experience for scientists, decide when and how to pursue new partnerships or respond to new opportunities, and enhance the public program experience for participants. Therefore, reflection should occur in an ongoing cycle, before, during, and after program planning and implementation. As you'll see, even the process for implementing a Portal to the Public project begins with the highly reflective conceptual planning process, which should be revisited frequently throughout the stages of the program.

To help your team in the reflective process, many chapters in this manual include a section called Take Time to Reflect, which provides you with guiding questions to think about successes, challenges, and possible improvements based upon your experiences as you work through each aspect of your program. Think through your responses with your team and other stakeholders, and add your own reflection questions as appropriate. The process need not be overly time-consuming nor burdensome. In general, scheduling short periods of time for dedicated reflection and documenting any resulting ideas or outcomes is enough.

In addition to reflecting on your own Portal to the Public implementation efforts, it is critical to establish a culture of reflection with scientists participating in your program. Reflection enables learners to detect inconsistencies in their thinking and identify connections between areas of conceptual understanding. Later sections in this manual revisit the importance of reflection for scientist participants and list strategies for building reflection into their professional development experiences.

Building a Reflective Practice

Purposeful reflection on your work is key to creating successful programs. In fact, evaluation of early Portal to the Public organizations found evidence that the intentional inclusion of opportunities for reflective practice was tied to effectiveness and ongoing improvements during the three years of the original project.

Consider the following strategies to help support a reflective practice:

- Convene the core staff working on the Portal to the Public project after each professional development session and public program to share observations and feedback from scientists and/or program participants, and to reflect on possible improvements.
- Create a folder or binder of Portal to the Public workshop agendas and public program outlines. Record suggested changes for the next iteration of professional development or public programming directly onto these documents, such as, "Build in more time for the scientists to write question sequences for their activities."
- Meet regularly with key contacts at partner organizations to reflect and debrief, particularly following events or programs.
- During public programs, spend time informally observing the interactions that are occurring between scientists and program participants. Ask scientists for their thoughts on their interactions. Reflect with other ISE staff on the successes, challenges, and dynamics that you see.
- Conduct an annual meeting or focus group with six to ten participating scientists to talk about their experiences of the program, its strengths, weaknesses, and areas for improvement.
- Organization-wide goals and priorities change over time. Periodically reflect on how Portal to the Public can be used to meet current organizational goals and fit into your broader suite of educational efforts.

Evaluation is a process that helps to formalize and systematize your reflective practice. Chapter 6 of this manual describes strategies for evaluation of Portal to the Public programs in more detail, as well as how evaluation can support long-term project sustainability.

One final thought before we begin: a note about terminology

Throughout the process of revising and updating this manual, the Portal to the Public team has made decisions about the terminology we use to refer to various aspects of this approach. For example, we have opted to use the term "scientists," though we really mean for this work to be considered broadly inclusive of a wide variety of science-based professionals. We have opted for informal science education (ISE[1]) to refer to the approach to learning that encourages exploration of science, technology, engineering, and mathematics in settings outside of the formal education system. ISE organizations include science and technology centers, natural history museums, zoos, nature centers and parks, aquaria, science camps, community programs, plus print, film, and broadcast media. We have also chosen to embrace the term "engagement," which is widely invoked at the time of this writing, to describe our goal of enabling interactions that are driven by curiosity and a sense of personal relevance and agency. We recognize and remind our reader that preferred terminology changes quickly in our rapidly evolving field as we learn more and more about the complex interplay between science, technology, and society.

1 Informal science learning is characterized as predominantly "learner-motivated, guided by learner interests, voluntary, personal, ongoing, contextually relevant, collaborative, nonlinear, and open-ended." National Research Council, *Learning Science in Informal Environments: People, Places and Pursuits* (Washington DC: National Academies Press, 2009), https://doi.org/10.17226/12190.