THE HABIT-FORMING GUIDE
TO BECOMING A

Systems Thinker

Waters Foundation

by Tracy Benson & Sheri Marlin

"How excited I am to see the habits taught in this book now available to many! The principles (presented as habits) shared in this book have the power to change the lives of individuals, enhance organizational dynamics, and even improve the way in which nations interact with each other. All organizations, whether from the private or public sectors, from small or large enterprises, or from powerful to struggling firms with a global or local scope, desperately need to adopt these habits. Each habit, if learned, practiced, embraced, and then shared with others has the potential to be a powerful tool to achieve greatness together as a human system on this planet. I encourage all to not only read the content but to truly incorporate the principles into their life. Thank you, Tracy and Sheri, for writing this great book and sharing it with all of us!"

— Fernando Mendoza, Chief Human Resources Officer, MODEC INC., Tokyo, Japan

"I came across systems thinking as a school of thought only three years ago but have been regularly amazed by the power it holds. I'm also often struck by how our most successful projects adopted systems thinking techniques before we even realized consciously what we were doing. The ability to see, understand and influence systems is one of the greatest capability needs in business (and in the world, generally).

We're working to build this capacity within my team as a way to unlock deeper, more meaningful long-term change. Do we understand points of leverage? Are we aware of the preconceived notions – or "mental models" – that we bring to a project? Do we resist the urge to come to a quick but superficial solution? Can we see the circular nature of cause and effect? If we can build these capacities, we will be infinitely more effective. The Waters Foundation's tools have been a helpful and fun way to make these concepts accessible. I just ordered their "Habits of a Systems Thinker" cards for my entire department!"

— Stacey Tank, Chief Communications Officer, The Home Depot

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Dedicated to
James and Faith Waters
Our mentors, supporters and sources of inspiration

Delivering benefits to make the world
a better place for everyone!

WHAT PEOPLE ARE SAYING ABOUT THE WATERS FOUNDATION AND THE HABITS OF A SYSTEMS THINKER:

"I believe in systems thinking because I've never seen anything that can be so consistently applied. I see it as a toolbox of critical thinking skills that students can use to demonstrate analysis or make their critical thinking visible. Like Batman has his utility belt for whatever problem he's faced with, these kids have these tools."

— David Rifkin, High School Teacher, Hewlett-Woodmere Public Schools, Woodmere, NY

"The Habits of a Systems Thinker are helping educators bring a coherent overall framework to a field that has had many pioneers in various school settings. We are now witnessing that seeing the big picture, identifying circles of causality, understanding how the structure of a system produces its behavior, and recognizing the benefits of looking at problems from different perspectives can help educators focus on deeper thinking skills across virtually all curricula and ages."

— Daniel Goleman, author of *Emotional Intelligence* and co-author with Peter Senge of *The Triple Focus*, morethansound.net

"I've always really valued a classroom where I'm developing critical thinking skills with students who are genuinely engaged. When I use this language of the Habits and these tools with kids, it makes me more excited in my teaching because I start hearing kids who are questioning other students' assumptions in very diplomatic, very grounded ways and conversations really rooted in evidence and curiosity."

— Daniel Murphy-Cairns, Elementary Teacher, Portland, OR

"Systems thinking habits and tools help students articulate their understanding of the systems they are studying. When middle school students have visual tools that assist their learning and encourage them to think deeply about things that matter to them, they become more motivated and engaged. I've been a middle level administrator for 21 years and have not found a better way to improve school culture, address organizational challenges and promote rigor and relevance in classroom instruction."

— Kathy Scheppe, Former Middle School Principal, Currently Director of K-8/Elementary Schools, Tucson Unified School District, AZ

"There is no more difficult task than to take very complex concepts and simplify them so that people of all ages can grasp and apply them. This 20-year effort that produced the Habits of a Systems Thinker shows that the value is clearly worth the investment."

— Peter Senge, best-selling author of *The Fifth Discipline*, senior lecturer at MIT

"The essence of Systems Thinking is understanding relationships and their implications. Developing a formula for doing that is essentially impossible though the Habits of a Systems Thinker are the best possible alternative. The Habits of a Systems Thinker provide alternative perspectives through which one should consider a situation and identify relevant connections that should be included in the relationship map. We seek the path, we find the path, we travel the path, we become the path, and the Habits of a Systems Thinker provide critical components for the 'travel the path' component." — Gene Bellinger, Director, Systems Thinking World Inc.

Seeks to understand the "big picture"

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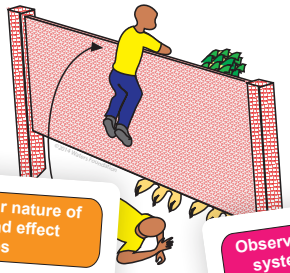
Changes perspectives to increase understanding



Considers an issue fully and resists the urge to come to a quick conclusion

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Identifies the circular nature of complex cause and effect relationships

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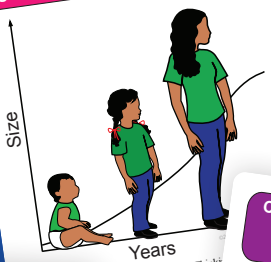
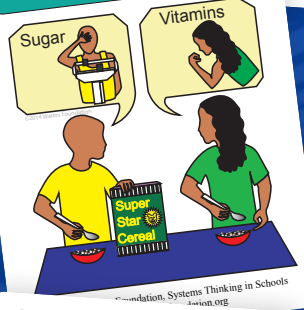
Observes how elements within systems change over time, generating patterns and trends



Surfaces and tests assumptions



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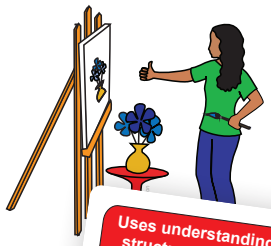
Checks results and changes actions if needed: "successive approximation"



Considers how mental models affect current reality and the future

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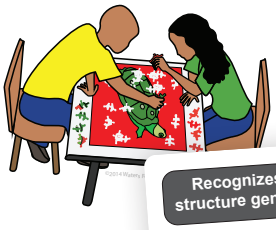
Considers short-term, long-term and unintended consequences of actions

Makes meaningful connections within and between systems



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Uses understanding of system structure to identify possible leverage actions

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Recognizes that a system's structure generates its behavior

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Pays attention to accumulations and their rates of change

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Recognizes the impact of time delays when exploring cause and effect relationships

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Table of Contents

Foreword by James Waters 3

Getting Started 5

The Habits of a Systems Thinker

1 | Makes meaningful connections within and between systems 8

2 | Seeks to understand the big picture 16

3 | Changes perspectives to increase understanding 22

4 | Considers how mental models affect current reality and the future 28

5 | Observes how elements within systems change over time, generating patterns and trends 34

6 | Surfaces and tests assumptions 44

7 | Recognizes that a system's structure generates its behavior 52

8 | Identifies the circular nature of complex cause and effect relationships 58

9 | Recognizes the impact of time delays when exploring cause and effect relationships 70

10 | Considers short-term, long-term and unintended consequences of actions 76

11 | Considers an issue fully and resists the urge to come to a quick conclusion 84

12 | Pays attention to accumulations and their rates of change 90

13 | Uses understanding of system structure to identify possible leverage actions 100

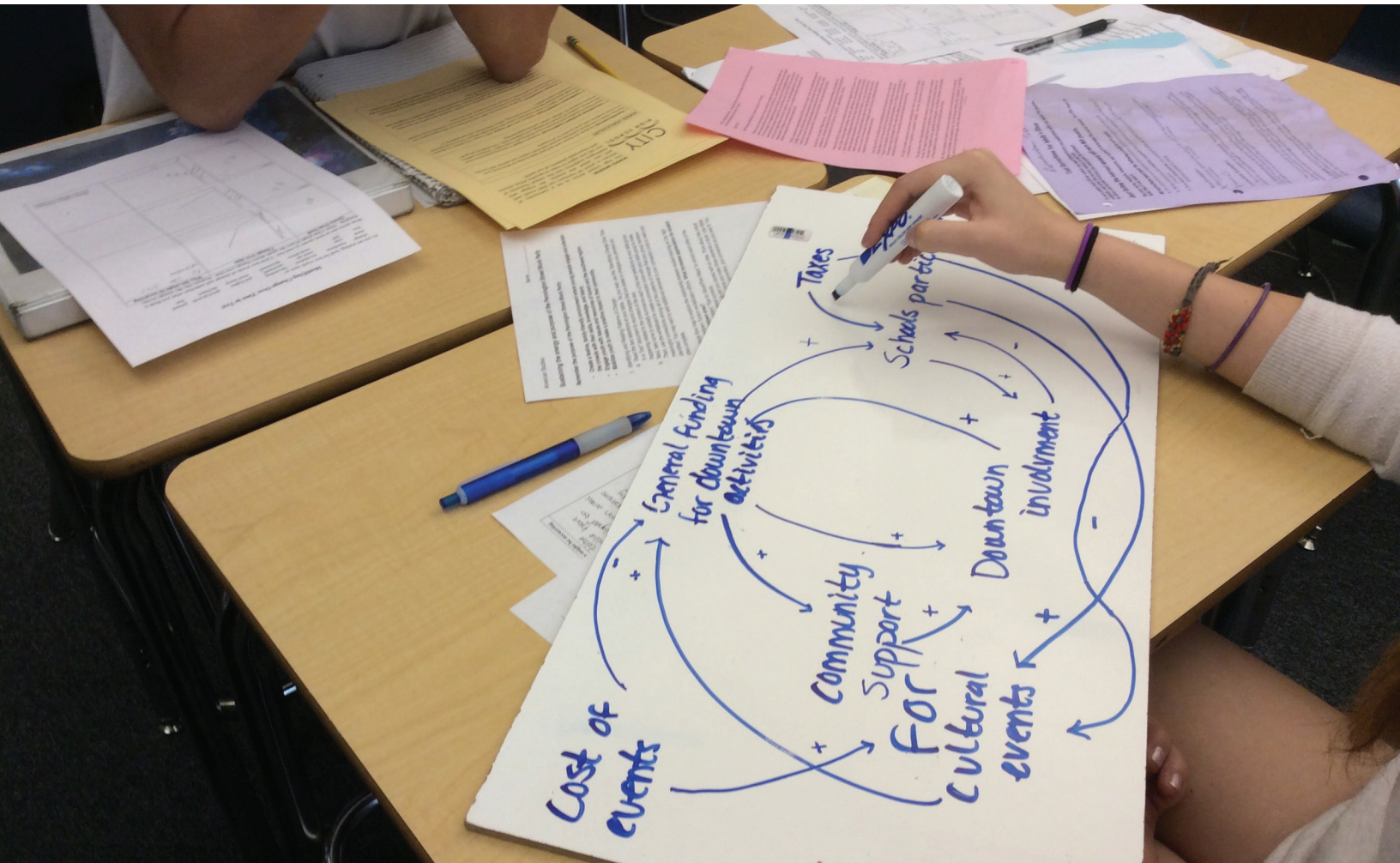
14 | Checks results and changes actions if needed: "successive approximation" 110

Habits in Action: Exercises for Next Steps 118

Endnotes 136

Index 139

Acknowledgements 140


Taxes
Central funding for downtown activities
Community Support For Cultural events
Downtown involvment
Cost of events

Foreword

By James Waters, Founder and Former CEO of Waters Corporation and Founder of the Waters Foundation

When I reflect on my career and life, one thing is certain: I have always been a systems thinker.

The fundamentals of systems thinking came naturally to me. As a young man growing up in Lincoln, Nebraska, there were many systems in place crucial to my productivity. The company that I grew from five employees has grown to over 6,000 today. It has seen lasting success because of the principles of systems thinking. For over 50 years, Waters Corporation has delivered innovative analytical laboratory instruments and software in over 100 countries.

In fact, I credit my success and dynamic perspective of the world to my ability to create a plan, identify challenges, implement changes and most importantly, harness a drive to deliver beneficial results. In short, I have built my life around always trying to do the right thing and "**deliver benefits**."

It was not until the early 1980s, however, that I came to understand that this type of thinking had a name. Its creator, Dr. Jay Forrester of the Massachusetts Institute of Technology (MIT), introduced me to system dynamics. A few years later, I learned that Dr. Gordon Brown, Dean Emeritus of the College of Engineering at MIT, was bringing systems thinking into Tucson schools to enhance the way K-12 students approached learning. I jumped at the opportunity to get involved.

Since then, the Waters Foundation has implemented systems thinking in schools throughout the U.S. and internationally. We've trained more than 10,000 educators in the last 25 years. The value of systems thinking goes beyond the classroom — it is applicable to the boardroom, businesses, communities, relationships, and for virtually every person from every walk of life. It has been a great pleasure to see lives changed and minds broadened because of our work to share this process with others.

Our goal is simple: to make the world a better place. This goal may sound lofty, but that is the power of systems thinking — anything is possible with the right set of tools. That is why I am so proud to introduce this guidebook, which provides an in-depth explanation of the Habits of a Systems Thinker. I sincerely hope you find the tools as beneficial as I and countless others have over many years.

The authors of this book, **Tracy Benson** and **Sheri Marlin**, along with its many contributors, have done an outstanding job. You will be provided with real-life examples of the Habits and exercises to get you thinking about how you can apply the Habits to your own life and work.

I encourage you to approach these activities with an open mind. Do not shy away from challenges or ideas that may not come to you intuitively.

Challenges are our allies. They indicate that you are working toward a goal. When we create ways to overcome these challenges, I believe our best qualities and strongest intellect are brought to the surface. **What's more, the pleasure of delivering benefits is wonderful!**

I hope you enjoy lasting success from your time spent learning and practicing the Habits of a Systems Thinker.

Now, let's get started …

Getting started

This guidebook is for anyone who wants to actively learn about and engage in the process of becoming a systems thinker. The Habits of a Systems Thinker and systems tools that connect to them help develop deep and practical understanding of the world. No matter what your experience is with systems thinking, whether you are a novice or a skilled practitioner, this guide offers a workable approach to your personal development.

Designed as a hands-on workbook, each chapter highlights one of 14 Habits of systems thinking. The Habits of systems thinking are the foundational building blocks that define and describe the practices of a systems thinker. Whether you read this book to develop your leadership capabilities, coaching or teaching expertise or your parenting skills, the intention is to provide a wide and relevant practice field. The Habits offer practical ways of thinking that inform action. They provide a framework to help you reflect on your strengths and identify areas of growth. On the inside back cover, you will find a set of Habits cards to use as you work through this guidebook.

The guidebook includes a chapter for each of the 14 Habits of a Systems Thinker:

- Makes meaningful connections within and between systems
- Seeks to understand the big picture
- Changes perspectives to increase understanding
- Considers how mental models affect current reality and the future
- Observes how elements within a system change over time, generating patterns and trends
- Surfaces and tests assumptions
- Considers short-term, long-term and unintended consequences of actions
- Recognizes that a system's structure generates its behavior
- Uses understanding of system structure to identify possible leverage actions
- Considers an issue fully and resists the urge to come to a quick conclusion
- Identifies the circular nature of complex cause and effect relationships
- Recognizes the impact of time delays when exploring cause and effect relationships
- Pays attention to accumulations and their rates of change
- Checks results and changes actions if needed: "successive approximation"

Throughout each of the 14 Habits chapters, you will be engaged in practices that help build your potential to positively shape the future.

Each Habit chapter contains

- Descriptions, stories and examples related to the 5 sample systems
- Opportunities to help you Practice the Habit include reflection questions and strategies to build your understanding and skill
- Systems thinking tools: behavior-over-time graphs, stock and flow maps, causal loops, ladders of inference, connection circles and icebergs that apply to specific Habits, along with practice exercises with the tools
- Connections to other Habits of a Systems Thinker because no one Habit exists in isolation

Habits in action: exercises for next steps

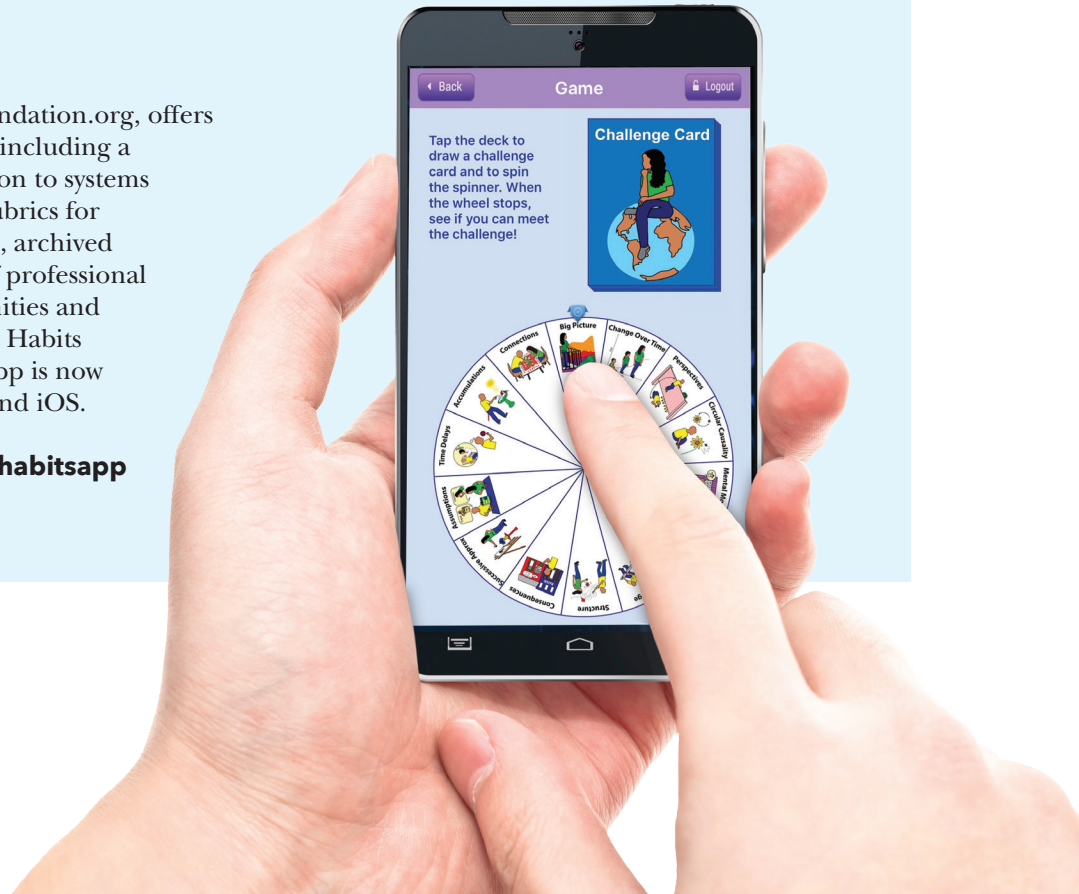
Following the 14 Habits chapters, the Habits in Action section offers a wide range of exercises to support ongoing learning and collaborative sharing. The hands-on exercises and facilitated activities can be applied to work settings or life outside of work. The exercises listed below include comprehensive directions, required materials and scripted debrief questions.

- Habits of a Systems Thinker Self-Assessment for Individuals
- Habits of a Systems Thinker Self-Assessment in a Group Setting
- Habits of Leaders We Know and Admire
- Habits of a Systems Thinker Team Reflection Matrix
- Pipes and Marbles

Digital Resources

Our website, watersfoundation.org, offers a number of resources including a multi-media introduction to systems thinking, assessment rubrics for students and educators, archived webinars, a calendar of professional development opportunities and more. Additionally, the Habits of a Systems Thinker app is now available for Android and iOS.

http://tinyurl.com/sthabitsapp



The Five Systems

Your understanding of the systems in your life and work will affect your decisions, your actions and the way you choose to live. We have identified five basic life systems that involve people. In this guidebook, each system is represented by a circular icon. These sample systems are included throughout the guidebook and are used in practice exercises and anecdotal examples. To get started, reflect on each of the five system types.

Icons	Sample Systems	Describe how each of these five systems relate to your life. How and why are they applicable and important to you?
	Well-being Personal well-being as a system involves your physical, emotional and social health. It also considers your state of being happy and prosperous.	
	Family This system considers all of the people you choose to identify as your family, both immediate and extended, and may include people of all ages.	
	Workplace Your workplace considers systems that could include paid employment, a volunteer position, your life's calling, or any role you play where you make a contribution to others.	
	School As a place for learning and preparation, school is a system that is common to all of us. Your school could be a public, private, charter or home setting and could be a system that you attended or any other place of learning.	
	Community Your community could be a place where you reside or a place where you belong. It could be a town, city, an affiliation or network. Your community involves relationships that are formed around a common purpose.	

"For many years, I and others in my group at work have had The Waters Foundation's thirteen "Habits of a Systems Thinker" prominently posted on the walls by our desks. In the press of our day-to-day work, the "Habits" remind each of us of what it means to be a systems thinker, which each of us aspires to be. Now, it is so wonderful to have this new workbook that we can both learn from ourselves, and use to more effectively introduce the Habits to others, both at work, and in our relationships and connections beyond work. For me, a surprise in the book was inclusion of a fourteenth Habit not on our wall postings: "Makes meaningful connections within and between systems." This fourteenth Habit (1st in the book) led me to wonder about connections among the Habits. Then I noticed that many of the Habit chapters in the book contain sections titled, "Connection to other Habits of a Systems Thinker." Thank you, Tracy, Sheri and The Waters Foundation for the careful thought put into the book! I know, just as with your "Habits" wall postings, we will use your book over and over for many years to come…"

— Paul Newton, Systems Engineer in the Aerospace industry, Seattle, WA, USA

Benefits of a systems thinking approach

As you apply the 14 Habits of a Systems Thinker to the five systems in this guidebook, deepening your understanding and making connections, we believe the Habits will become valuable tools in your life and work. In our experience working with numerous organizations, we have found that the Habits are very effective in helping people achieve their desired results. The Habits offer both a common language and a shared framework for the kinds of thinking that produce meaningful change.

This book is also meant for sharing, so we encourage you to read and engage in the practice exercises with others. A systems thinking learning journey is collaborative and seldom a solo endeavor. Share this book with others, make it a focus with book study groups and use it to collaborate, share perspectives and develop the systems mindset that will optimize your ability to manage the complexity of today's world.

We hope you enjoy this guidebook and look forward to hearing about your experiences and applied learning.

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