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Preface

This book is all about energy—the energy we produce, the energy we use, the energy we waste as we devastate our climate—and the energy of youth who hold the power to shape the future of Earth. *Empowering Young Voices for the Planet* supports an award-winning collection of films that document the power of young people to preserve our planet.

This book is also a guide to *energy management*. In it you'll find ways to use the incredibly energizing stories of youth in action in your classroom and community. You'll see what can be accomplished and learn how to empower more young voices. This is a manual to help mentors and guides. Prepare to be fired up!

The films in the *Young Voices for the Planet* collection describe the true stories of nine youth projects. Beginning with nothing but enthusiasm, young scientist-activists have accomplished amazing things. Some of these projects started with school enrichment groups, some with clubs, and some with Scouts. Other projects began with outstanding individuals—true leaders—who saw problems and imagined solutions. Many of them had influential mentors, but the credit is all theirs. Through the films and the activities on the pages that follow you can learn about their paths to success and be inspired to find your own.

The *Young Voices for the Planet* films have been well received by large audiences at the United Nations, the American Museum of Natural History in New York, the Denver Museum of Nature and Science, and the annual conferences of the Association of Science-Technology Centers (ASTC), the American Bar Association's Environmental Law Conference, and the National Science Teachers Association. The films were screened at COP15 (the international climate talks in Copenhagen) and included in the "prep kit" for Next Generation, a program that helps students in Copenhagen develop sustainable strategies for their schools and communities. The films also toured with the Mountainfilm in Telluride and Wild & Scenic traveling film festivals. Everywhere they go, the films are making an impact.

In the introduction to this teaching guide, you will learn about the *Young Voices for the Planet* approach to teaching climate change. As you'll see, we use an innovative pedagogical strategy incorporating several key findings from recent research as well as insights gained from the observed success of the *Young Voices* films. Our approach to climate change education is mindful of the psychological impact of alarming scientific information. Past approaches to climate change have engendered fear and denial by focusing too much on the disturbing truth about climate change and not enough on the positive actions students can take to prevent dread scenarios from occurring. The *Young Voices* program is pioneering a positive alternative that replaces fear-based instruction with action-oriented inspiration.

Part I of this teaching guide will help you build lesson plans based on the films. As you will see, we present a synopsis of each film along with classroom activities and literacy prompts to help you integrate the films into your curriculum. Part I also features correlations to the Next Generation Science Standards (NGSS) and Common Core for each section. Lessons for the films can fall naturally into almost any system's middle-level program with plenty of possible extensions into elementary school and high school curricula.

For example, the films and activities can be used as an introduction to climate science or to an energy curriculum for upper elementary through high school. Or they can be integrated into individual lessons on science, technology, engineering, or mathematics (STEM), social studies, or environmental studies. They can also be used to teach about democracy and civic engagement. Finally, you can *STEAM* up your classroom by infusing the arts-based activities in this guide into STEM curricula.

Part II of this book is a practical action guide to beginning a project that is important to your own community. Whether the project is integrated into the regular curriculum, structured for enrichment or remediation, or organized under the auspices of a club or community effort, you'll find many practical tips for success. "Think globally, act locally" isn't just a bumper sticker. It's the game plan for exciting and powerful student activism. Part II describes how in-school and after-school groups can begin their own efforts to save the planet from human harm. Here you'll find nitty-gritty details on planning, financing, safety, and liability.

We hope that you will use the films along with the Part II action guide to start a project in your own community of learners. We're confident that once you allow your students to open up their experience and imagination, they can take the lead. So you may want to let your students choose whether they would like to replicate one or more of the projects in the

Young Voices for the Planet films or develop their own projects for reducing carbon dioxide (CO₂) emissions. The possibilities are endless. You might set up a community screening of the films followed by a presentation of the students' CO₂-reduction projects. Or show the films to inspire members of the larger school community as to what might be possible. The films are great for theatrical as well as classroom screenings. Shown back-to-back all together or individually, they can be used as an introduction to your own action science efforts. Often, youth inspire their communities when they speak after screenings at film festivals—or at such venues as landmark movie theaters or local multiplexes—and share information about their science and service projects.

So don't hesitate to encourage such efforts in your school and community. Youth activism doesn't have to be highly political. Students don't need to take sides or associate themselves with a partisan movement. In the best tradition of a democratic society, students can look at different sides of an issue, do scientific research, work together, and use creative thinking to help solve serious environmental and societal problems.

The human journey to save the planet's fragile ecosystems has begun. Now is the time for your students to join the adventure!

Introduction

The Young Voices Approach to Teaching Climate Change

Educators, academicians, scientists, and the scientifically and environmentally aware public agree that it is essential for students to have an understanding of Earth systems and climate change science. Global climate change is upon us, and it will play a huge part in the future of youth worldwide.

But teaching about climate change has proven challenging because students often turn off and shut down when they begin to understand its dire consequences. Learning about climate change can easily engender fear leading to denial or apathy. It is often easier to deny the science than to embrace the reality of a planetary emergency.

So it is essential that we go beyond science content when teaching climate change. Thus this book pairs scientific content with the *Young Voices for the Planet* films. These films showcase stories of youth solutions to the climate crisis, providing real models of positive pathways to change. As Shannon McComb (age thirteen) says in one *Young Voices* film, “If you adults won’t do something about global climate change, then we kids are going to take the reins.” Kids absolutely can take effective action against climate change, and they are doing it now all over the world. Moreover, their empowered responses are helping these youth feel *less* defeated by the climate crisis and *better* about themselves.

The *Young Voices for the Planet* films are changing the face of climate change education by replacing fear with action. The dynamic youth portrayed in the films exhibit many qualities that foster success. For example, these youth know how to work collaboratively with peers, teachers, school administrators, government and businesses officials, and others. They show that it’s possible to address climate change by identifying win-win solutions for all stakeholders.

The *Young Voices* educational approach rests on solid research and observation. For a decade, scientists and educators assumed that if people

understood the seriousness of the climate crisis, they would act. But, in fact, the more scientific information people heard, the stronger was their denial. Various studies have shed light on why people avoid accepting the facts about climate change: psychologically, they just cannot handle the disturbing truth. Instead of motivating them to learn more and act, learning about frightening natural hazards generally motivates people to *avoid* learning more science! In 2012, a study in the *Journal of Personality and Social Psychology* named this response to frightening facts “motivated avoidance.”¹

A study by Professor Anthony Leiserowitz, director of the Yale Project on Climate Change Communication, revealed similar findings. Leiserowitz found that climate-related images invoking fear produced a strong negative affect and actually impeded people from accepting climate change science.² These studies and others make it clear that factual information alone cannot be the basis of climate change education.

But ignoring the problem is no way to calm students’ fears either. Research shows that children who are not allowed to discuss and process fears are actually more fearful than children who have the opportunity to express their thoughts and fears.

So we must rethink how to teach climate change. The approach used in the *Young Voices for the Planet* films and in this teaching guide is gaining currency among educators who had, in the past, unwittingly scared students into “motivated avoidance.” Our approach encompasses the key strategies described below.

ELEMENTS OF *YOUNG VOICES* CLIMATE CHANGE EDUCATION

Storytelling

Everyone is captivated by a good story, and each *Young Voices for the Planet* film tells an inspiring one. Even better, these stories are true! Each film profiles real-life characters and presents moving tales of challenge and success. The films are nonfictional but are told in an entertaining narrative style. After all, they are produced by Lynne Cherry, acclaimed children’s book author and storyteller. (See the note from Lynne about the origin of the *Young Voices for the Planet* films on page 10.)

Positive Role-Modeling

The students profiled in the films live in different places, have strikingly different personalities and circumstances, and offer diverse ideas about

how to preserve Earth’s life-sustaining climate. Nevertheless, each exhibits qualities universally admired, such as compassion, responsibility, caring, creativity, and the ability to collaborate. Regardless of how students identify themselves culturally—whether they are into sports, student government, video games, art, hanging out at the mall, or none of the above—they are sure to find role models they admire and can relate to in the *Young Voices* films.

Climate Change Portrayed as Real, Present, and Relevant

As we all know, students complain about curriculum that makes them wonder, “Why do I need to know this?” Irrelevant curriculum is perceived as boring and meaningless. But the truth is that climate change science is all too relevant. Presented in the right way, it’s an extremely compelling topic because the stakes are high and time is running short. It is perhaps the most meaningful, relevant, and important topic that you will teach in your lifetime. In our approach to teaching climate change, we do not suggest that you waffle or downplay the urgency of the issue so as to avoid alarming your students. Rather, we hope you will invite your students into the awareness that the climate needs our protection—now!

Solutions, Not Scary Scenarios

There is clear consensus among scientists that climate change threatens human civilization. Many effects of our warming climate have been forecast, and this program invites students to learn about them. In particular, we encourage students to investigate climate predictions relating to the places where they live. This being said, it’s imperative that you avoid dwelling on possible negative outcomes. Rather, we give you tools to support students in their creativity, problem solving, and resolve to do something. Part I of this teaching guide gives you an array of activity ideas to keep the focus on student empowerment and growth, and Part II supports your efforts to build a custom project.

Science Integrated With Social Studies, Literature, Math, the Arts, and More

As we have noted, climate change education needs to involve the whole student—hand, heart, and mind—rather than just the intellect. Thus the *Young Voices* program is thoroughly subject integrated.

Practical Skill Building and How-to Tips

Changing the world takes practical skills and savvy as well as positive intentions. So Part I of this teaching guide is replete with activities that build science process skills such as observing, estimating, predicting, and inferring. Skills for civic engagement are needed too, so students will learn how to write letters to business and government officials, how to contact news and other media outlets, how to employ social networking, how to convene public meetings, how to analyze issues and the claims of experts in the media for accuracy, and so on.

Correlation to Standards

The Next Generation Science Standards (NGSS) are clear about the importance of climate science in school curriculum. Also, the Common Core contains mathematics and literacy standards that support interdisciplinary curricula such as climate change science. Thus there are many ways in which the *Young Voices for the Planet* program satisfies Common Core as well as NGSS. A few standards that *Young Voices* supports are listed here in the box headed “Standards.” A more complete list is included in Appendix II.

STANDARDS

Sample NGSS: Disciplinary Core Ideas

ESS3.C: Human Impacts on Earth Systems

- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)
- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)

- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)

ESS3.D: Global Climate Change

- Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

Sample Common Core English Language Arts Standards: Science and Technical Subjects

Integration of Knowledge and Ideas

CCSS.ELA-Literacy.RST.6-8.7

- Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-Literacy.RST.6-8.8

- Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CCSS.ELA-Literacy.RST.6-8.9

- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Humor and Fun

Humor can help to dispel the anxiety of hearing heavy messages about climate change and grab the attention of a youthful audience, enabling students to *hear* the message. For example, when the kids in the *Team Marine* film dress up as plastic-bag and bottle-cap monsters and galumph down the street in slow motion, the audience erupts in rollicking laughter. Such comic relief provides a welcome counterpoint to outright disgusting images of plastic marine debris killing sea turtles and ocean birds. Likewise, many activities in this teaching guide involve art and expression, and team-building exercises such as cooperative games. In serious times, it's sometimes important to lighten up!

Collaboration and Community

Truly, protecting Earth's climate will require contributions from everyone—not just a certain social group. Everyone has a different piece of the puzzle and everyone is important. The notion of “leaders” and “followers” doesn't make much sense when all kinds of projects on every scale are needed and when big projects need people to carry out plans as much as they need people to formulate them. The spirit of climate change activism—and this program—is cooperative!

Self-Efficacy

The *Young Voices for the Planet* program nurtures young people's *self-efficacy*, their faith in their own ability to create change. Achieving self-efficacy is valuable lifetime learning. Self-efficacy is a big part of how people think of themselves and an important component of mental health. Building self-efficacy will help students for the rest of their lives!

A key to teaching youth about climate change is to encourage them to think critically and to take action on what they've learned. As they observe that they do have power to take meaningful action, their sense of self-efficacy grows. Further, building self-efficacy is an iterative process. That is, the more empowered a student feels, the more she can do—and the more she accomplishes, the higher her sense of self-efficacy rises, and the more she can do next time. This is a virtuous cycle.

Albert Bandura of Stanford University (Department of Psychology) is credited with developing self-efficacy theory. He has documented how “efficacy beliefs” affect the way individuals perceive their ability to create personal and social change. In his book *Self-Efficacy: The Exercise of*

Control, Bandura states: “Efficacy beliefs shape the outcomes people expect their efforts to produce. . . . People of low self-efficacy are easily convinced of the futility of effort in the face of impediments. Those of high self-efficacy view impediments as surmountable through perseverance.”³

Bandura’s research also shows that young people’s beliefs regarding their ability to change things affect their emotional lives and how much stress, anxiety, and depression they experience in threatening or disheartening situations. Those who believe they can manage problems and adversity view life as less threatening and take action to change things. So developing self-efficacy in young people helps in their personal growth and in their role as global citizens.

As previously discussed, studies show that scaring students with frightening information about climate change makes them less likely to want to learn more and act. Students become overwhelmed, a state that is bad for them and bad for a warming world. But self-efficacy theory shows us a way out. If students believe they can make a difference, they will be motivated to learn more and act. Building self-efficacy and learning about climate change must go hand in hand, or else despair or denial will likely result.

Bandura’s book describes three ways to build self-efficacy, and the *Young Voices for the Planet* educational program employs them all. They are as follows:

1. **Building mastery.** This is the most effective way to strengthen self-efficacy. Let students act and support them so that they can view their actions as successful. For example, if your students learn how trees remove CO₂ from the atmosphere and then plant trees, they will have taken a successful first step toward reducing climate change and this will help them build mastery.
2. **Social modeling.** If people can relate to others they see taking actions, they are likely to believe that they can, too. The diversity of students profiled in the *Young Voices for the Planet* films allows students to see their peers—students like themselves—making a difference, which can lead them to think that they can, too. As Olivia Bouler states in *Olivia’s Birds and the Oil Spill*, “If they can do that, then so can I.” In *Plant for the Planet*, Felix, an eleven-year-old German boy, starts a website that goes viral and leads to worldwide youth planting billions of trees. Often a child will feel that he or she is as irrelevant as one small raindrop, but many raindrops make a stream and then a river. Felix’s campaign allows youth to see themselves as a river of young people creating an ocean of change. Thus watching the *Young Voices* films jump-starts students’ self-efficacy, boosting their confidence and desire to act.

3. **Social persuasion.** If your students are persuaded that success is possible, if they say, “I think I can,” they work harder than if the voices in their heads say, “I can’t do it.” The youth activists in the *Young Voices for the Planet* films model self-efficacy and faith in others’ capabilities too, all of which makes success more likely.

In summary, based on research and experience, we believe that climate change education works best when it builds self-efficacy at the same time it builds knowledge. Without the opportunity to act and the confidence to do so, students tend to default into despair or denial when faced with the challenges associated with climate change. We ask: How can a teacher build self-efficacy in her students? And we answer that question with Bandura’s finding that “mastery” builds self-efficacy most powerfully. But social persuasion and social modeling can work too, and they certainly get students headed in the right direction. *Young Voices* pedagogy uses all three roads to self-efficacy. And that is why it works!

Finally, a couple of quotes on the importance of self-efficacy:

The most common way people give up their power is by thinking they don’t have any.

—Alice Walker

The world will not be destroyed by those who do evil but by those who watch them without doing anything.

—Albert Einstein

The *Young Voices for the Planet* climate change program is a comprehensive platform with multiple learning resources. The films and this teaching guide are parts of a larger strategy that we have developed as part of a multimedia platform including K–12 curricula, the book *How We Know What We Know About Our Changing Climate*, a website with downloadable resources, television programming, catalog distribution to schools and libraries, and many other components.

How did this multifaceted project get started? More than a decade ago, Gary Braasch, renowned environmental photojournalist, began documenting weather extremes and polar melting as well as interviewing climate scientists worldwide. His book *Earth Under Fire: How Global Warming Is Changing the World* was one of the first books that vividly made the case that humankind needs to act now to counter global warming.⁴ Braasch’s book spawned the award-winning children’s book *How We Know What We Know About Our Changing Climate*, coauthored by

Braasch and Lynne Cherry.⁵ Cherry, the producer of the *Young Voices* films and coauthor of this teaching guide, is an environmental writer/illustrator and author of the *The Great Kapok Tree, A River Ran Wild*, and thirty other popular children’s books. The book that Cherry and Braasch wrote together on climate won fifteen major awards, including Best Science Book for Middle Schoolers from the American Association for the Advancement of Science.

As successful as the Cherry-Braasch book was, Cherry wanted to do more to help youth grapple with the issue of Earth’s warming climate in a positive, inspiring format. Hence the *Young Voices for the Planet* films were born, as described here in the “Note From Lynne Cherry.” Now this teaching guide, coauthored by Cherry and veteran science educators Juliana Texley and Suzanne Lyons, expands the power of the *Young Voices for the Planet* films with concrete teaching strategies, activities, and how-to information. Enjoy!



Source: Lynne Cherry in Australian rainforest. Photo by Gary Braasch from *How We Know What We Know About Our Changing Climate*.

MISSION STATEMENT

The mission of the *Young Voices for the Planet* climate change program is to give young people a means to speak out, create solutions, and lead the change to a more sustainable future.

A NOTE FROM LYNNE CHERRY

When Gary Braasch and I wrote our book *How We Know What We Know About Our Changing Climate: Scientists and Kids Explore Global Warming*, we believed that we were writing a hopeful book. We included stories of young people doing research similar to that of the scientists on the Intergovernmental Panel on Climate Change. And we included success stories of young people reducing CO₂ emissions. But, after hearing from educators, we realized that our positive empowering messages needed to be even stronger. Teachers needed concrete models for replication.

To this end, we produced a series of films, *Young Voices for the Planet*, that introduce climate science through success stories of young people reducing the carbon footprints of their homes, schools, and communities. These stories of empowered youth also demonstrate that, as thirteen-year-old Alec Looz says, "Kids have power." The films embrace diversity; the young people in these films, from across the ethnic, geographic, and socioeconomic spectrum, have an earnestness and a sincerity that touches our hearts. As Anya Suslova from Siberia stated emphatically, but with a smile, "You can make a difference, so do something!"