

EcoKids

Raising Children Who Care for the Earth



Sample file

Dan Chiras

Advance Praise for EcoKids

Finally a book that helps parents nurture their children into holistic environmental thinking from an early age and lights the way to instilling a profound reverence for the Earth. In the tradition of Aldo Leopold, with *EcoKids*, Dan Chiras brings us practical ways to environmentally inspire our children by example — an absolute must read if we're to provide stewardship for future generations.

— JOHN SCHAEFFER, founder and president of Real Goods
and the Solar Living Institute

In *EcoKids* Dan Chiras focuses on touching the hearts and minds of our youth, for the future of the world depends on what they feel, think, and believe. Most importantly he has given parents the tools by which they can raise children who truly care for the Earth. It's a must read — long overdue.

— DENNIS WEAVER, actor, founder of Institute of Ecolonomics

EcoKids is an excellent resource for environmentally conscious parents who want to teach their children what it means to be a responsible citizen of the Earth. Nurturing a love of the environment, along with proper instruction on environmental protection are can help parents instill in their children a lifetime of conscientious action. It should go without saying that our future depends on it.

— MARTY STOFFER, host of "Wild America"

EcoKids encourages and empowers children, parents, and educators to respect and restore nature and to live environmentally sustainable lifestyles.

I believe this book will help preserve endangered habitats, bring new vigor to the field of environmental protection, and help create the strong, unshakable environmental ethic the world so desperately needs.

— DAVID WANN, coauthor *Affluenza: The All-Consuming Epidemic*

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TABLE OF CONTENTS

Acknowledgments	vii
Introduction: My Path to Sustainable Living	1
Chapter One: Changing the World One Child at a Time	9
Chapter Two: Fostering Love for Nature	27
Chapter Three: Ecological Literacy: Teach Your Children Well	53
Chapter Four: Promoting Environmental Values	85
Chapter Five: Affluenza, Television, and Your Child	113
Chapter Six: Swimming Against the Mainstream: Combating Advertising and Affluenza	133
Chapter Seven: Walk the Talk: Teaching by Example	157
Chapter Eight: Ensuring Success	183
Resource Guide	215
Index	222
Selected Titles by the Author	228
About the Cover	229
About the Author	231

This book is dedicated to my friend Chance Ruder in appreciation for all he has done to protect and enhance wildlife and create a humane, sustainable future. I sleep better at night just knowing you are out there "fighting" the good fight with love, compassion, insight, wit, and wisdom.

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*The loftier the building, the deeper
must the foundation be laid.*
— Thomas A. Kempis

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I expect to pass through life but once. If therefore, there be any kindness I can show, or any good thing I can do to any fellow being, let me do it now, and not defer or neglect it, as I shall not pass this way again.

— William Penn



Introduction

MY PATH TO SUSTAINABLE LIVING

The deteriorating state of the environment was the last thing on my mind during the first twenty years of my life — in the 1950s and 1960s. First, environmental concerns were only just starting to make the front pages of American newspapers. Second, I was pretty oblivious to the issues of the day. I had my mind on other things like swimming in the creek that ran behind our house, taking care of my family pigeons, baseball, school, and farm work.

More than oblivious, I was clueless. Even at Scout camp, in the deep rich deciduous forests of the Adirondack Mountains in upper New York State, during my early teens I struggled through the soil and water conservation merit badge class. I was bored, frankly, and unaware of what all of the fuss was about. The merit badge counselor, who seemed so passionate about his subject, a guy we called “Nature Boy” behind his back (I’m ashamed to say), was the butt of our youthful snobbery. We couldn’t wait until class was over.

Those who know me realize that somewhere along the road from my oblivious youth to adulthood, something profound must have taken place, something that changed me so deeply that I turned my back on a potentially lucrative career in medicine (sorry Dad) in favor of a fulfilling, but clearly less financially profitable, and often disheartening environmental career.

What was it? What “lightning” bolt from the heavens struck me so compellingly that I devote nearly every waking minute of my days to the protection of this tiny piece of real estate in the vast expanse of space?

Actually, it was not a single high-voltage bolt of inspiration that rocked my world, but a series of seeds sown during my early life — various events and discoveries — that individually had little effect, but cumulatively conspired over a period of many years to create in me a deep and resolute devotion to environmental protection.

One of the first lightning bolts occurred when I was a teenager. The Scout troop I belonged to was hiking along a remote section of the Appalachian Trail. I'm not even sure where we were. I think we were in Connecticut.

As our troop trudged happily along, our homemade wooden pack frames creaking with each step, we suddenly entered an unusual patch of forest, a remnant of the eastern old-growth forest — miraculously spared from the saw. This part of the forest was unlike the younger forests that we had been tromping through all day. It consisted of trees so tall that I strained my neck to see their top branches. The leaves of these monstrous trees intercepted nearly all sunlight, creating a cool, dark environment.

Although I did not know that we were in an old-growth forest, I could feel the magnificence and grandeur of these stately trees that had stood for hundreds of years against all sorts of weather. I felt a stirring in me, the closest thing I've ever had to a religious experience. My spirit rose for a few minutes, and then plunged as we exited into the hot, sunny neighboring forests, no doubt harvested within the past forty years.

The experience was over in a flash, but I was changed forever.

Unbeknownst to me, a small seed had been sown in my heart and in my mind.

Our troop hiked on to our camping spot, several miles farther along the trail.

No one said a word about our brief encounter with that ancient remnant of the old-growth forest that once carpeted much of the nation's eastern half.

Deep inside, the seed remained, like the memory of a loved one's touch or a smile from a loving grandparent.

When I first heard the term old-growth forest in my twenties and read articles outlining the threats to them and the dire need to protect them from further clearcutting, I needed no convincing. My brief encounter left no doubt in my mind that the ancient forests were a treasure to be safeguarded, not an amenity to squander for short-term profit.

My love for this small remnant of ancient forest has translated into a lifetime of unyielding sympathy for venerable old-growth forests. Over the years, it has stirred me to write dozens of letters to congressional representatives, US presidents, and conservation groups, lobbying for their protection. It has also helped me learn to use wood wisely or avoid wood use entirely (hence the reason my

home is constructed largely from straw bales and rammed earth tires).

But truthfully, this experience did not convert me overnight to an environmental sympathizer.

There were other experiences and lessons I learned along the way that forged my devotion to and respect for the natural world. Years earlier, while I was in grade school for instance, I remember watching a television program with my family. The show was a biography of some great person. (I am embarrassed to say that I can't recall who it was now.) The narrator commented that throughout his life, this remarkably accomplished individual sought "to leave the woodpile a little fuller."

It was a cold wintry night, which somehow contributed to the power of this analogy. What a novel idea, I thought. It was as if that notion became imprinted on my consciousness. Life isn't just about what we get; it's about what we do for others, what we leave behind.

Years of being a Boy Scout brought that lesson home over and over again. I saw grown men giving their time to take us camping or hiking or to teach us canoeing. My dad volunteered at the district level. I can still see him trotting off in his Boy Scout uniform. He looked a little silly, well very silly, to be truthful, but I was proud of him for giving his time so generously, and still am. He set a good example for a lifetime of giving to others for which I am eternally grateful.

A few years later, as a member of a Scout troop, I found an immediate outlet to give to others by assuming the role of teacher and leader. I taught many a boy how to tie his knots and perform dozens of other skills we learned in Scouts. Teaching has been a role I've assumed ever since, not for financial gain, but to satisfy a deep desire to give back, to leave the woodpile a little fuller, and to share my love and enthusiasm for knowledge.

Another profound influence occurred in high school, quite a few years after my brief encounter with the old-growth forests of the Appalachian Trail. At my father's insistence, my family was living in rural upstate New York on a 13-acre (5.2 hectare) site in the country. (He was adamant about bringing us up in the country, a fact for which I remain eternally grateful.)

Our property was bordered by a dense, wide marsh that crackled with the cacophony of red-winged black birds. Through the marsh ran a slow-moving creek that was our playground. We fished for bluegills, bullheads, and carp, rowed our boat in search of turtles, and swam in the warm waters day after glorious summer day. We never experienced boredom.

Several years after we moved in, though, the creek that meandered toward our property and through deciduous forests and lush farm fields of beans and wheat upstream from us, turned foul almost overnight.

Why?

Many miles away upstream, a Duffy-Mott factory that ground apples into applesauce had, for reasons we never discovered, decided to discharge huge amounts of organic waste into the stream all at once.

The organic detritus from the factory migrated downstream, rotting in the shallow waterway, depleting oxygen, and choking out all fish life. It put an abrupt end to our summer afternoons on the “creek” — as the local farmers called it. The creek became so odoriferous that year, we had to hold our noses as we passed by the smelly waterway on the school bus.

In the years that followed the initial release the stench gradually subsided, but the plant nutrients the company had released into the creek stimulated massive growth of algae and aquatic vegetation. In short order, the creek became choked with tangles of vegetation so thick that it was difficult to row our boat. Each time we tried to row through the creek, or fish — reeling in balls of weeds with our line along with bluegills and sunfish — we cursed the factory that created this disaster.

The pollution of the stream upset me, but not enough to make me do anything. I was pretty easygoing about things, even those which I had no control. Unlike my boyhood friend John Bower, who wrote a poem to memorialize the event and read it at an assembly to crucify the perpetrators, I simply shrugged my shoulders in youthful resignation.

Still, another seed was planted.

This one serves as a personal reminder of how one thoughtless act can have devastating consequences on the environment, and how it can upset the lives of many for years to come. Today, when I hear about a stream being polluted, it is not some abstract event. I think about the fish that perished in our stream when the plant matter rotted in the fall, using up all the oxygen. I think about the rancid smell that pervaded our nostrils, and the many people affected by this event. This indelible event lingers in my mind, so that stories of stream pollution in distant rivers are painfully real to me, dredging up old memories and old anger.

In 1968, at the age of 17, I left for college in the Midwest. Tucked away in the quaint and quiet town of Manhattan, Kansas, at Kansas State University, a hotbed of political apathy, I remained sheltered from the real world for four years. I spent my time studying organic chemistry, zoology, cell biology, embryology, human anatomy, and the like to prepare for a career in medicine. While I pored over my notes and reading assignments, memorizing everything I could in the library, protests over the war in Vietnam reached a fevered pitch. If the truth be known, I did follow the war, but political activism did not suit my studious nature. Even though concerns over the state of the environment were stirring among the general public, I was pretty oblivious to the world around me. I was eyeing a career in medicine.

But fate (if you believe in such things) had other plans for me.

During my senior year, on a trip home to see my parents, I decided to stop in at Northwestern University Medical School in Chicago to talk with the dean about my application. As I neared Chicago, however, I passed some factories in Gary, Indiana. Huge clouds of black smoke poured from the stacks, darkening the sky.

“My God,” I murmured, and turned to leave the area, disgusted.

“How could anyone in their right mind pour so much filth into the air we breathe?” I wondered.

Even though evidence of acid rain and other forms of air pollution had not yet been brought into public attention, and I had never studied pollution and its environmental impacts, it just seemed intuitively wrong to me that we should release so much junk into the air we breathe.

At that moment, another seed was sown, a seed of doubt. For a moment, something vague passed through me; a question as to my career choice. Maybe, I mused for a moment, medicine wasn't the correct route. Maybe there was a “bigger patient” to heal.

But the thought quickly passed. I'd never heard of anyone making a career out of environmental protection. K-State didn't even offer a course on the subject.

The next year, my dream of a career in medicine crumbled. The admissions office at Northwestern University Medical School apparently lost my application and the only other school I had applied to (UCLA) turned me down. Being an out-of-stater, I stood about as much chance of getting into UCLA as a trout surviving opening day in the cool waters of the rivers in Naples, NY, when anglers line the banks elbow-to-elbow.

So I changed my plans. I enrolled in a Ph.D. program in reproductive physiology at the University of Kansas School of Medicine in Kansas City. I was fascinated by the subject and hoped to matriculate in the medical school a few years into my doctoral program. As an M.D./Ph.D. I could teach and do research at a major medical school.

Clearly, despite my jarring experience in Gary, Indiana, I was unable — or unwilling — to give up my dream of a career in medicine, and I had no data to suggest that I could make a living “saving the planet.”

As a graduate student, I immersed myself once again in course work, absorbed in the intricate details of the human body. But again, fate would deal me different cards. A couple of years later, after completing my course work, I began my research. With a bit more free time on my hands, stories on the nightly news about pollution and other environmental ills began to captivate my attention. I began to read books such as Paul Ehrlich's *The Population Bomb*. The draw toward environmental protection grew ever stronger.

Feeling torn between a career in medicine and my growing concerns for the environment, I found some release by reshaping my modest existence to create a more environmentally responsible lifestyle. In 1971, at age 21, for example, I started recycling, a practice I continue today. Since then, I have recycled every can, bottle, newspaper, and piece of cardboard that has entered my home. Back then, I even volunteered to take neighbors' recyclable materials along with me. You will still find me picking up cans and bottles along the road on evening walks or in parking lots. When on business trips, I devotedly cart home cans, bottles, and even paper napkins from restaurants — rather than throw them away.

As a graduate student, I drove a small, energy-efficient car, a VW bug. I usually walked wherever I needed to go, and I began writing a column on the environment for the student newsletter, merging my two greatest loves, writing and the environment. I even began spending weekends backpacking in the Ozarks of southern Missouri.

In the last year of my Ph.D., I applied to the medical school program and was accepted. A few weeks later, and after much painful deliberation, I turned the offer down. I took three weeks off to backpack in Colorado, as if looking for vindication of my decision. In southwestern Colorado, I strapped on my pack and headed into the San Juan Mountains. There, I photographed wildflowers and gazed out upon magnificent rocky peaks, reveling in the minute and the magnificent and everything in between. Nature's beauty filled my heart.

While hiking high in the mountain country, I came across an ancient clear-cut, ravaged by erosion and still struggling to heal. I knew at that moment that I had made the correct decision. Somehow, I knew I had to be a part of larger healing, a process much more important than attending to patients whose arteries were clogged with cholesterol from eating too many Big Macs. I needed to be a part of a broader, perhaps more essential, healing.

Upon completing my Ph.D., I was offered a teaching and research position in the biology department at the University of Colorado in Denver, which I gladly accepted. There I taught courses I'd been trained for — cell biology, microanatomy, reproductive physiology, and endocrinology. In my spare time, however, I began to study a wide range of environmental issues now appearing on America's (and my) radar screen. I began teaching courses on environmental pollution as an overload to my regular course work, so as not to aggravate the department chair who had hired me as a biologist, not an environmental science instructor.

The more I read, the more serious the problems appeared, and the more certain I was that I'd found both a cause and a career. It's not often we can meld our loves so seamlessly.

From this point, I went on to a career as an environmental educator, writer, public speaker, and consultant. Every book I've read, every newscast I've seen, every polluted sky I've viewed has deepened my resolve to fight for the environment and a better future for all, and to live a life that is consistent with my values.

Since then, I've published 21 books, most of them on some aspect of environmental protection or sustainability, including several best-selling college textbooks. I've published several hundred articles, also principally focused on building a sustainable future. I lecture widely these days to audiences all over the country, and teach workshops on passive solar heating and passive cooling as well as natural building. I also consult on green building and other aspects of sustainability.

Today, I'm living a dream, pondering and writing about — and hopefully helping to solve — the environmental nightmare humankind has created. I'm raising two children to care for the Earth. We live in a state-of-the-art environmental home, powered by solar and wind energy and constructed from many recycled and environmentally friendly materials.

One lesson I've learned from my own journey, when it comes to raising children to care for the Earth, is that a great many factors may forge one's commitment to the environment. Don't expect a single inspirational bolt of lightning to change your child, to electrify his or her passion and commitment. Although there are exceptions to the rule, the vast majority of the people I interviewed, when researching this book, were influenced by a variety of factors: parents, teachers, experiences, readings, and classes in high school or college.

Becoming a parent for the first time can, in and of itself, be a powerful stimulus for change. Mary Golden, an aspiring green architect from Rochester, New York, for instance, confided in me, "Having my daughter was probably the most head-turning event in making lifestyle and career changes. It suddenly became very important to me to work and to live in a way that supported life, protecting the environment for her and other people's kids."

Several people I interviewed believe that they were environmentally oriented from early on. "I think I was born an environmentalist. Ever since I can remember, environmental protection has resonated with me," notes James Plagmann, a Colorado-based architect who is building a successful business designing environmentally friendly homes. Even so, his life of environmental commitment has been shaped by many outside forces, including important books, television coverage of environmental issues, school projects, college teachers, and influential architects.

Others stumbled upon it in the most unusual way. Ed Evans, my junior high school chemistry teacher, noted, "In my second year of teaching, my boss told me

that I would teach Earth science. I fought this suggestion but was forced to give in.” He had no background in Earth science. “I had to teach myself the course as I went along, and by the time that first year was over, I was hooked on appreciating our planet. And I could fire up the kids, too!” Ed went on to nearly 35 years of inspirational teaching, helping many students understand and develop a passion for the environment and environmental protection.

So be patient and hopeful. Plant seeds. Provide your child with many opportunities to foster his or her innate love for nature. Provide opportunities to develop a deep understanding of the importance of the environment to our lives, and the lives of all people and all other living things. And be sure to breed hope by helping them see how their actions — combined with those of others — can truly change the world for the better. Yes, if everyone lit just one little candle it would be a brighter world!

And don’t forget to live consistently with your values.

Set a good example and hope they’re watching, listening, and learning to be people who will make a huge difference in their own lives, leaving the woodpile much fuller than when they arrived.

ABOUT THIS BOOK

This book contains advice on raising children who care for the Earth, derived from my own experience as a father of two boys, from numerous other adults I’ve interviewed, and from experience in the field. My hope is that this information can help you steer your children to a life of environmental responsibility.

As you shall soon see, this book also contains background information on key environmental issues and other topics to help you become a more informed parent and teacher. It is my belief that if you understand the issues, values, and ecology, you’ll be more effective.

In this book, I’ve also included numerous inspiring stories — typically short pieces on kids who are making a difference. You may want to read them aloud to your family. For further inspiration and ideas on actions people can take to create a sustainable future, I’ve included short case studies I call “Models of Sustainability.” These case studies highlight what businesses and governments are doing to help build a sustainable future. They also provide additional background information on some of the most pressing environmental concerns.

At the end of each chapter, you’ll find a list of family activities to help drive home the key ideas presented in this book. Finally, at the very end of the book is a resource guide, a list of important books, magazines, videos, organizations, and websites that could help you and your family reach your full potential.

*You cannot escape the responsibility
of tomorrow by evading it today.*

— Abraham Lincoln



1 CHANGING THE WORLD ONE CHILD AT A TIME

To many people in our society, the word *environment* is a four-lettered word. Just mention the word in some crowds and you'll likely be dismissed as a "bleeding heart liberal" or a "tree hugger."

Those inclined to ridicule your and your desire to protect the environment do so, in large part, because they view environmental protection efforts as subversive to human progress. Those on the extreme right, in fact, hold the mistaken notion that environmental protection undermines the economy that puts food on our tables and shelter over our heads and big screen TVs in our living rooms.

The anti-environmental faction sees environmental protection not only as an impediment to economic progress but as a threat to our way of life. Moreover, some critics of environmentalism view it as a form of elitism. Environmentalists, they say, pursue a narrow agenda designed to save pretty places for backpackers and bird watchers. Protecting the environment puts hard-working men and women out of work. They lose their jobs and their families suffer deeply because of the environmental protection efforts of elitists. The backbone of the economy, the labor force, they contend, endures hardship while economically valuable land and its resources are set aside to protect our playgrounds.

It's too bad our schools and the media haven't tried to correct this dangerous misconception. If they had mounted a successful campaign to educate people on the true underlying value of the environment, detractors might be able to see

that by actively opposing environmental protection, they are, figuratively speaking, shooting themselves and their children — and their children’s children — in the feet. They might realize that their environmental ignorance and resultant disdain for environmental protection that translates into environmentally contemptuous policies may benefit them in the very short term, but will foreclose on their own future and the future of subsequent generations, ultimately making it harder and harder for people to live a decent life and make a decent living.

*All ignorance toboggans into know
and trudges up to ignorance again:
but winter’s not forever, even snow
melts; and if spring should
spoil the game, what then?*

— e.e. cummings

Robert Goodland, an ecological economist, writes that the “environment is the source of all our resources and the sink for all our waste.” That is to say, everything around us comes from the environment. Every bit of food we eat, every piece of clothing we wear, and every drop of water we

drink comes from the Earth and its once rich ecosystems. Even synthetics such as plastics and nylon come from the environment — in this case, from chemicals extracted from crude oil, which was geologically manufactured from the remains of ancient marine algae. Moreover, the light shining from incandescent light bulbs in the living rooms of many households comes from coal, fabricated in the Earth’s thick crust from ancient plants. These plants trapped solar energy several hundred million years ago in the Carboniferous era, then were deposited along swamps where they were buried by sediment. Over time, heat and pressure transformed the plant matter into coal. When we burn this black, carbon-rich fuel, we release the ancient solar energy. The energy liberated at power plants lights our homes and powers our computers and runs our washing machines.

Forests, fields, rivers, and oceans are the source of the resources that make our lives possible. They are also the source of most money in the human economy. Today and every day, our lives and our economy are dependent on a sound environment.

Too bad detractors don’t get that point.

As a parent, you can make sure your children don’t grow up ignorant of this essential fact.

Ecosystems, as you’ll see in Chapter 3, also supply us with many free services — like clean air and protection against flooding and insect control. These benefits are free to us, until we destroy them. Then we either suffer or spend

millions trying to replicate what nature once offered gratis.

There's another point that's important to realize. The environment serves as a repository for all of our waste — not just garbage, but sewage and a wide assortment of toxic pollutants from factories, power plants, homes, and cars. The soil, the water, and the air are a dumping ground for human wastes. Unfortunately, the soil is also the source of our food and fiber. Waterways provide the water we drink and bathe and swim in. The atmosphere provides the air we breathe.

Polluting the common resources we need for survival is clearly not one of our better ideas. It's a bit suicidal. However, all species do it. Pollution is inevitable. But we humans produce so much waste that it often exceeds the ability of the ecosystems we live in to assimilate or dilute the wastes to harmless levels. It's too bad detractors don't

understand the pollution we produce has dangerous backlashes, for example, the violent weather and flooding we're experiencing very likely resulting from global warming due to the excessive production of greenhouse gases from cars, factories, homes, jets, and so on. (At this writing, in the summer of 2004, the United States is about to be clobbered by its fourth major hurricane of the season.) Again, this is a fact you can help your children realize. We pollute and destroy natural systems at our own peril.

So, not only are we dependent on the environment to supply our resources and get rid of our wastes, we're treating it with disregard for possible repercussions. Herman Daly once wrote that "most nations are treating the Earth as if it were a corporation in liquidation." We are rapidly selling off its assets to the highest bidders. Are these claims exaggerated?

ECOTRENDS: ARE WE ON A SUSTAINABLE COURSE?

In over 30 years of studying environmental issues and tracking environmental trends, I've seen significant progress in many areas. In the United States, for example, recycling has increased dramatically. Nationwide, 31 percent of our waste is now recycled. Soil conservation efforts are paying off too. Soil erosion has dropped dramatically thanks to historic legislation that has taken highly erodible land out of production. Nationwide, Americans have become more

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efficient in their use of resources such as water and energy. Factories produce less hazardous waste and huge tracts of wilderness have been set aside for protection.

Unfortunately, there are many signs that paint a troubling picture. In a nationwide study I performed a few years ago, for example, I found that trends in such areas as carbon dioxide emissions, population growth, energy consumption per capita, industrial energy production, transportation, destruction of farmland, and loss of wildlife habitat showed significant movement away from sustainability. On balance, the negative trends offset the positive ones by a 3 to 1 ratio. All in all, the trends suggest quite strongly that we're living and conducting business on the planet in an unsustainable fashion.

To get an idea of how significant our impacts are, consider the impact of human activity on just one day, a technique my colleague David Orr, an Oberlin College environmental studies professor, likes to use to give his audiences a realistic view of what's happening to the planet — and us.

A study of environmental trends suggests quite strongly that we're on an unsustainable course.

On a typical day on planet Earth, says Orr, we destroy 140 to 180 square miles (363 to 466 square kilometers) of tropical rainforest. That's a two-mile wide, 70-mile long (3.2 kilometer wide, 112 kilometer long) swath of land, cleared of its diverse and colorful biological garment to produce timber and to make room for mines, roadways, farms, and new towns. To date, over three million square miles (7.7 million square kilometers) of tropical rainforest have been lost to development. That's an area half the size of the United States.

On a typical day, the world's nations pump more than 15 million tons (13.5 million metric tons) of carbon dioxide into the atmosphere, largely from the combustion of fossil fuels, gasoline, coal, oil, and natural gas. For well over 100 years, scientists have known that carbon dioxide is a greenhouse gas. That is, it traps heat radiating from the Earth's surface somewhat like the glass in a greenhouse. Scientists have known that a little bit of carbon dioxide is good for us; in fact, it's required to create temperatures hospitable to life on Earth. If carbon dioxide were missing from the Earth's atmosphere, our planet would be 50°F (27.5°C) cooler than it is today. Very few, if any, life forms could exist in the frozen wasteland.

While small quantities of carbon dioxide are good for us, too much can cause serious overheating. The heat excess carbon dioxide traps is kept from escaping into the vast expanse of outer space. Abundant evidence suggests that

the accumulation of carbon dioxide and other greenhouse gases is now causing the Earth's surface temperature to spiral upward like that of a patient with an uncontrollable fever.

While many readers know that the world has suffered from perpetual hot spells in the past couple of decades, few realize how significant it is. At this writing in 2004, 17 of the hottest years in 100 have occurred since 1980. While heat spells are not uncommon, having so many swelteringly hot years in a row is extremely unlikely. It is statistically quite improbable. Recent studies show that the 1990s and 2000s represent the hottest period on Earth in the past 2000 years.

Global warming is not just making the Earth's surface hotter, it is dramatically altering the climate, influencing rainfall patterns that result in costly floods. While some areas are wetter, others suffer searing and devastating droughts. Forest fires are breaking out with great regularity, even in tropical climates. Who knows what this is costing us in lives lost each year? In the summer of 2003, France suffered 20,000 deaths, mostly among the elderly, in a summertime hot spell. In Colorado, where I live, the US Forest Service posted a fire warning in January! Who knows what this wacky weather is costing our society, but the price tag is surely in the tens of billion of dollars each year.

On a single day, Orr tells us, scientists estimate that the planet loses approximately 100 species. Most of the losses occur as rainforests topple, as coral reefs die — largely due to warming seas but also due to pollution and sediment — and as wetlands are cleared to make room for humans. While species do become extinct naturally, modern extinction is occurring at a greatly accelerated pace. In fact, we're losing species approximately 30 times faster than through natural extinction. Moreover, the face of extinction has changed. During natural extinction, many species disappeared, but they were typically replaced by evolutionary offshoots, new species that emerged from the old. In modern extinction, species are wiped out completely, without a trace — that is, without a new lineage. Modern extinction is forever. John Ryan of the Worldwatch Institute summed up the situation best: "Difficult as it is to accept, mass extinction has already begun, and we are irrevocably committed to many additional losses."

On a typical day, 70 million tons (63 million metric tons) of topsoil are lost from the world's farmlands. To put this into perspective, that rate of erosion results in a loss of 24 billion tons (21.6 billion metric tons) per year. Over a decade, that's 240 billion tons (216 billion metric tons) — equivalent to approximately one half of the topsoil on US farms.

While we systematically tear apart the Earth's rich biological tapestry, let our soils wash away, and pollute the air, water, and land, the human population — which depends on the Earth and its declining ecosystems — continues its

inexorable expansion. On a typical day, nearly 250,000 — one-quarter of a million — people are added to the planet's population. That's a quarter of a million new residents, each needing food, water, shelter, and clothing — all derived from the environment — to survive.

And tomorrow, it all starts over again.

CHANGING THE WORLD ONE CHILD AT A TIME

I saw a bumper sticker the other day on a Toyota Prius, one of the new energy-efficient, clean-burning hybrid cars. It read, "I don't know where we're going, but what's this hand basket I'm in?"

Surely, if you study the trends seriously for any length of time it is difficult to avoid the feeling that we humans are heading straight over a cliff.

Nevertheless, many think that trend need not be our destiny.

We have a chance to heed the signs, to make mid-course corrections.

The changes must begin with each of us. We adults can't wait for generations of children to clean up the mess.

The longer we dally and the further we drift off our once-sustainable course,

the more difficult it will be for our children to repair the damage and restore the Earth.

We must begin now.

It is also imperative that parents, teachers, and others train our children now to work with us and to eventually take over for us. It is imperative that we help create kids with ideals, values, and a serious commitment to live environmentally sustainable lifestyles. That's what this book is about. It's a guide for parents who want to help out by leaving behind a living legacy — children — who *will* make a difference.

Generations of environmentally responsible children are needed to make the changes in our lives and our economy. Inevitably, some of our children will become leaders. Some of them will grow up to replace today's environmental leaders. Some will lead influential environmental organizations that help shape thinking, policy, and action in profound ways here and abroad. Others may play equally important roles as teachers in public schools or colleges and universities.

The idea that crises have both negative and positive aspects is captured in a word the Chinese have for crisis, wei-chi. The first part of the word means "beware, danger." The second part, however, has a very different implication. It means "opportunity for change."

— Peter Russell
The Global Warming

Sample file

Others may become writers or news reporters. Still others may become influential scientists or even eminent politicians who lead the charge. This book has some advice for parents, teachers, and others to encourage our youth to follow an environmental career path.

But not all children need take an active role in education, writing, and governance. Not everyone needs to become an activist. Indeed, the vast majority of our offspring will not aspire

to such heights. It makes no difference. Far more important than a few good leaders are generations of good planetary citizens; that is, kids who become adults who use energy and other resources efficiently, and who recycle and buy recycled products. We need children who, when they grow up, opt to build solar homes or install solar electric panels on their energy-efficient homes made of straw bales and other environmentally friendly materials. We need children who will eventually grow their own food or buy organic produce from local farms, and who will compost kitchen and garden waste and use natural fertilizers and pesticides in the garden and yard. We need citizens who support the restoration of the Earth's endangered ecosystems and who, as adults, take responsibly their right to have children.

Moreover, we need doctors, lawyers, accountants, and business people who run environmentally sound businesses. We need copy shop owners and grocery store managers who ensure that their operations are carried out in an environmentally sustainable fashion. We need manufacturers who produce products in environmentally sound ways. You, as a parent, can help ensure this solid base of support for a sustainable society.

I hope the ideas in this book help.

I'm also hoping that this book will help parents teach their children to adopt environmentally responsible lifestyles now — refraining from the highly consumptive buying habits of their peers, turning off lights, helping with the family's recycling, using energy and water sparingly, biking or walking to school or to friends' houses rather than insisting on a ride from mom or dad.

While there are several books on raising children who care about and take action on social issues — kids who work to promote peace and eradicate poverty, homelessness, and hunger — I, also, will spend a little time on the subject. I do so because creating a sustainable world requires more than simply living

We can't wait for generations of children to clean up the mess. The longer we dally and the further we drift off our once-sustainable course, the more difficult it will be for our children to repair the damage and restore the Earth. We must begin now.

within the means of the planet. It means creating a just and peaceful global society where basic needs are met and where people live free from harm and are able to participate in their governance. Without these, there is no chance of achieving environmental goals. In countries torn by civil strife, as a rule, the environment will suffer. Sustainability has no chance of flourishing.

Not all children will need coaxing and teaching from mom and dad. Some are naturally empathic, that is, naturally inclined to feel a connection to the natural world. Several people I interviewed for this book indicated they felt an early affinity for wild places and the species that inhabit them. Such children may become the catalysts of changes within our families. This book is dedicated to one such child, Chance Ruder, who lives in San Antonio, Texas. His story is told in Chapter 8.

If you have such a child, my advice is to get out of his or her way. Be supportive and learn as much as you can from them. Although their reasoning may not always be sound, their hearts are in the right place. Following their hearts can lead you along a path of transformation that has profound effects on you and the rest of your family.

AVOIDING GLOOM AND DOOM

In Sweden, thousands of residents have rallied around sustainable development and have made many important strides in using energy efficiently, converting to renewable energy sources, building with environmentally friendly materials, conserving water, and preventing pollution. In fact, entire cities and towns have made a concerted shift toward sustainable lifestyles and a sustainable economy. They are called ecomunicipalities and are described in the book *The Natural Step for Communities*, by Sarah James and Torbjörn Lahti.

Although Sweden and many other European nations are far ahead of the United States when it comes to environmentally friendly attitudes, lifestyles, and businesses, the key to success in creating change rested, in large part, on educational efforts, particularly efforts to explain the impacts humans were having on the environment and how unsustainable our lives really were. Success with your children may also hinge on similar lessons. That is to say, you may need to present dramatic evidence of the need before you can expect children to accept the idea that we all need to live more environmentally sustainable lifestyles. You can do so, for instance, by describing the trends mentioned earlier in this chapter.

However, it is important, indeed essential, not to let your children become mired in gloom and doom. Such feelings may lead to a sense of despair and helplessness. Children may feel as if there is no hope. Hopelessness, in turn, may lead to disempowerment and, ultimately, to inaction. Inaction, of course, will get

us nowhere, and the only ones who will gain are the doctors who prescribe and the pharmaceutical companies that manufacture antidepressants — and, oh yes, the forces that stand in the way of sustainability.

KIDS WHO ARE MAKING A DIFFERENCE STUDENTS HEAT SCHOOL WITH ROTTING GARBAGE

Science students in Maryland Heights, Missouri, launched an ambitious program that could start a trend in the United States and abroad. Their project: to capture methane, a combustible gas released from rotting garbage in a nearby landfill, to heat their school.

Today, thanks to the efforts of a handful of students and a local businessperson, all 117 classrooms and two gymnasiums at Pattonville High are heated by methane from rotting garbage. Pattonville High is believed to be the first school in the United States heated by waste gas.

The methane, piped to the school by a 3600-foot (1100-meter) pipeline from the 85-acre (35-hectare) landfill, is burned in the furnace in place of natural gas. Thus, it not only puts waste to good use, it helps reduce their dependence on a finite fossil fuel. (The school is not entirely heated by methane. Some natural gas is needed for the cafeteria and other operations, but its use is minimal.)

What makes this all the more exciting is that the landfill operators used to burn off the waste gas. Even more exciting is that this project, which cost \$175,000, saves the school \$40,000 a year in heating bills. The savings paid the capital costs in fewer than five years. The principal of the school, Tom Byrnes, said, "The methane gas is there. It's a matter of burning it off or using it productively."

The US Environmental Protection Agency (EPA) estimates that 750 landfills in the United States could be tapped to generate gas. If only half of them were tapped, it would cut the emissions of thousands of tons of carbon dioxide each year. According to the EPA, this would be equivalent to removing 12 million cars from the road. Obviously, landfill waste gas is not the only answer to creating a sustainable future, but it can help.

New regulations require that landfills with more than 2.75 tons (2.5 metric tons) of trash be tested for gaseous emissions. If emissions exceed a certain level, the new Clean Air Act amendments require the

operator to install a system to collect and burn off the gas, to prevent possible explosions caused when the gas reaches certain levels. If methane can be put to good use, say proponents, it should be.

Adapted with permission from Daniel D. Chiras, *Environmental Science: Creating a Sustainable Future*, 6th ed., Jones and Bartlett, 2001.

AVOIDING THE PARADOX OF INCONSEQUENCE

While we are on the topic, years ago I “discovered” an unusual psychological trap that parents and educators must be aware of. I dubbed it the “paradox of inconsequence” in one of my very first environmental books, *Beyond the Fray: Reshaping America’s Environmental Movement*.

The paradox of inconsequence unfolds like this: As we go about our daily lives, many of us realize that there are serious environmental problems. However, for most of us, our role in creating the problems seems insignificant. We reason that we’re just one of around 300 million Americans or nearly 6.5 billion world citizens. Therefore, what we do is insignificant, of infinitesimal proportion. “Why fret about our actions?” we ask. “It makes no difference.” Freed from responsibility by the inconsequence of our own action, we drive gas-guzzling cars, fail to recycle, leave lights on, let the hose run longer than we should, buy the latest electronics, and consume as if there were no end in sight. “Why not? What difference does it really make? We’re just one of millions.”

Ironically, this logic creates many of the world’s environmental and resource problems. That is to say, millions of people all thinking their part is insignificant — and then acting accordingly — are largely responsible for many of the modern

environmental problems. It is one key reason why countries like the United States are on an unsustainable course. Our seemingly insignificant contributions, however, do add up. They create problems of epic proportions: millions

*Each snowflake in an avalanche
pleads not guilty.*
— Stanislaus Lee

of tons of carbon dioxide dumped into our atmosphere each day and millions of tons of hazardous waste from factories that produce the long list of consumer goods, and so on and so on.

Writer Stanislaus Lee put it best when he said, “Each snowflake in an avalanche pleads not guilty.”

But the ironies don't end here.

The sense of inconsequence that creates our problems also keeps us from solving them.

How so?

Quite simply: The logic that spawns our problems keeps many people from changing. "Why bother?" they ask, "My contribution to solving the problem is so insignificant. If I turn out my lights or use water efficiently or drive the speed limit or use public transport, my sacrifice won't amount to a drop in the ocean."

So why act?

Why do anything?

And so it goes: The logic that creates massive environmental problems and our sense of inconsequence, also keep us from solving them. Instead we rely on governments and business to solve them for us. We expect new laws or regulations to change behavior and new technologies to rescue us.

Although government and business can help, we can't rely on them to solve our problems. In fact, because of short-term thinking both entities may work at cross purposes, engaging in activities that force us further off a sustainable path. Surely, if we're going to successfully step back onto a sustainable course, we need their help, but we need to address pressing issues from the bottom up, too. And guess who's on the bottom?

We are.

And our children are.

And their children, and so on.

Generations of responsible citizens can change the world.

You and your children can be a part of the transformation, a positive force for the betterment of society.

THE IMPORTANCE OF POSITIVE EXAMPLES

To avoid gloom and doom and the crippling paradox of inconsequence, our children need to see and feel and be a part of positive solutions. While a hike through a clear-cut or a visit to the city dump can help them realize the enormity of our problems, it's just as important, maybe even more important, to take them on a tour of a recycling center so they can see for themselves the tens of thousands of tons of recycled cans, bottles and newspapers on their way back into the production cycle. Take them on a tour of a sustainably harvested forest or visit a sustainable farm or two. Take them to stores like Boulder, Colorado's Planetary Solutions, which sells environmentally friendly building materials, to see the options. Take them to tour homes built by green builders. Take them to alternative wastewater treatment plants that clean up sewage

using aquatic plants and capture the wastes for reuse. Encourage schools to tour wind farms. Tour the National Renewable Energy Laboratory in Golden, Colorado.

Create positive experiential connections, not just theoretical associations.

Be a positive example, too. Recycle, install energy-efficient lights, and grow your own food or participate in community-supported agriculture. Add up the savings to help your children see that their small part really counts. You can track your changes by joining or forming an EcoTeam. Discussed in more detail in Chapter 7, EcoTeams are groups of neighbors or friends who get together once a month for a period of six months. During each of their monthly meetings, EcoTeam members focus on one area, such as household waste, energy, water, or transportation. Using a workbook published by Global Action Plan, the nonprofit organization that created this program, neighbors discuss ways to cut back on waste and energy use, and each family comes up with its own plan. The actions are tallied and converted into real savings in resource use, pollution, and, of course, money.

Another option, discussed in Chapter 6, is to log on to the Center for a New American Dream's website, <www.newdream.com>. Here, you can set up your own personal workspace where you keep track of changes you and your family are making. The online calculator tallies the environmental impact of your actions. The Center also keeps a running total of all of the impacts of changes made by those who've logged on to their site. You can get a copy of their book, *More Fun Less Stuff: Starting Kids*, to guide you through the process. It also contains worksheets that allow you to keep track of your changes and the impacts of these changes.

You might want to get a copy of Phillip Hoose's book, *It's Our World, Too! Stories of Young People Who Are Making a Difference*. It's full of stories that may inspire your young ones.

One of the important points made in Marie Sherlock's *Living Simply with Children* is to be upbeat about the choices you make. As Sherlock observes, "When we take action that says we believe individuals can make a difference, our kids absorb that message and are empowered by it." Many of the people I interviewed for this book expressed a similar sentiment. Louis Hornyak, whose frugal parents came from Hungary, noted that they once "recycled the wood and nails from an entire demolished house and then used them to build fences and other structures. They never threw anything away! Never."

MODELS OF SUSTAINABILITY: GLOBAL WARMING AND WHAT ONE COMPANY IS DOING TO ADDRESS THIS ISSUE

Each day the Earth is bathed in sunlight. Approximately one-third of the sunlight striking the Earth and its atmosphere is reflected back into space. The rest is absorbed by the air, water, land, and plants. Sunlight absorbed by surfaces is converted into heat. This heat is slowly radiated back into outer space.

Scientists have long known that certain chemicals in the atmosphere such as carbon dioxide and water vapor can upset this process. Carbon dioxide molecules, for example, absorb heat and reflect it back to Earth. It and other pollutants act like the glass in a greenhouse. The phenomenon is therefore called the greenhouse effect.

The greenhouse effect helps maintain the Earth's surface temperature. Without it, the Earth would be at least 50°F (10°C) cooler than it is today. Most life forms could not exist, including humans.

Unfortunately, many greenhouse gases are produced from human activities. When we drive our cars or heat our homes or use electricity supplied by a power plant to light our homes or power our TVs, we are producing carbon dioxide that is heating up the Earth.

Greenhouse gases typically come from natural sources, too, but human sources are the greatest concern. That's because emissions from natural sources have remained fairly constant over the past 100 years while emissions from human sources have increased dramatically. Carbon dioxide emissions, for instance, have climbed over 30 percent in the past 100 years largely as a result of the combustion of fossil fuels — coal, oil, natural gas, and gasoline. They have also increased as a result of deforestation, clearing forests to make room for farms, cities, towns, and roads, and to provide wood and wood products. Why? Plants, like trees, take up carbon dioxide from the atmosphere and convert it into plant matter. As trees are stripped from the land, the Earth's capacity to absorb carbon dioxide decreases. Atmospheric levels increase.

Many scientists believe that the increase in greenhouse gases is responsible for rising global temperatures, known as global warming, which we have witnessed since 1960. Numerous scientific studies suggest that the increase in the Earth's temperature is affecting the planet. It may be changing rainfall patterns and may be responsible for an

increase in severe storms. In other words, it could be affecting global climate. Consequently, most scientists prefer the term global climate change over global warming.

Rising global temperature also affects natural ecosystems, agriculture, sea levels, insurance rates, and our economy. Further increases, which are likely to occur if we don't take actions, could result in a dramatic increase in global temperature and even more dramatic and costly changes in our climate. Scientists predict that sea levels will increase 20 inches (50 centimeters) from 1990 to 2100. The rise in sea levels would result from melting of glaciers and the land-based Antarctic ice pack and an expansion of the seas resulting from warmer temperatures.

Rising sea levels would threaten coastal cities throughout the world. Today, over half the world's population lives in coastal cities and towns. In fact, over 40 of the largest cities in the world are in coastal regions. Even a modest increase in sea levels would flood coastal wetlands, low-lying farm fields, wildlife habitat, and cities. The rise in sea levels would also worsen the damage from storms.

Less developed nations would also suffer enormously if the oceans rise. Low-lying island nations, many of them tropical resort places, already losing land to rising seas could be entirely submerged.

Shifting rainfall patterns and drought could cause devastating losses to farmers and reduce food supply. They could also result in more devastating forest fires. These changes could also have devastating effects on wildlife and could cause the spread of diseases that currently affect people only in warm, tropical climates.

Progressive companies throughout the world are taking steps to help protect us against global warming. One leader in this effort is Applied Energy Services (AES) of Arlington, Virginia, a power company that burns coal to make electricity. In 1988 it announced plans to help finance the planting of 50 million trees in Guatemala to offset carbon dioxide emissions of fossil fuel power plants it planned to build. AES also wanted the project to improve the economic conditions of communities currently affected by deforestation and preserve endangered plant and animal species.

AES has also taken steps to offset pollution from a coal-fired power plant on Oahu, Hawaii, that came online in 1992. Instead of planting trees, though, AES helped to protect a forest in Paraguay from destruction. AES agreed to donate up to \$2 million for the purchase and preservation of the 143,000-acre (58,000-hectare) Mbaracayu forest.

Located in eastern Paraguay, the Mbaracayu is one of South America's few remaining tracts of dense, humid sub-tropical forest. The area is vital to the survival of many species. It includes 19 distinct plant communities, at least 300 bird species, and threatened and endangered animals including tapirs, jaguars, giant armadillos, peccaries, the rare bush dog, king vultures, and macaws. The forest is the traditional hunting and gathering area for the Ache tribe. AES is partner in this project with the Nature Conservancy and a Paraguayan group that promotes sustainable development. AES has continued its carbon-offset programs with power plants in Oklahoma and Florida.

Individuals and businesses throughout the world can help reduce global carbon dioxide levels by planting trees, recycling, walking, bicycling, or riding a bus to school or work instead of using the car, by building smaller, more energy-efficient homes; by insulating existing homes, by using energy- and water-efficient appliances or doing some things by hand (for example, mixing by hand rather than using an electric mixer, or drying clothes on a line rather than using a dryer). When the time comes to buy appliances, choose the most energy-efficient ones available. New energy-efficient refrigerators, the leading user of electricity in our homes, can cut electrical demand from 1200 kilowatt-hours per year to 240. Using renewable energy can also dramatically reduce carbon dioxide.

THE WORLD OUTSIDE YOUR HOME

As I researched this book, I surveyed dozens of people who live environmentally friendly lifestyles, many of whom serve the cause in their professional lives. In my survey, I asked this group of dedicated individuals to describe the factors that influenced their life choices. While parents were influential in the majority of the individuals (70 to 80 percent) I queried, I was pleasantly surprised to discover that high school and college teachers also helped to shape young people's values and commitment.

Teachers can play a supportive role in some instances, or may be the prime influence in others. Interestingly, teachers were among the top three influences in shaping lives of environmental compassion and commitment — on a par with parents and slightly more important than experiences in the out-of-doors. One person I interviewed when working on this book was Jim Schley, a Vermont writer, editor, artist, and sustainable living practitioner. Jim was for-

tunate enough to be one of the late Donella Meadows's students at Dartmouth. Donella was an eloquent and thought-provoking teacher who led the world in shaping our understanding of limits to growth. Through her teachings, she also inspired many students to adopt careers and lives dedicated to environmental protection.

Doug Seiter, who lives in Denver, Colorado, and works for the Department of Energy's green building program says, "There was perhaps no greater influence on my connection with nature than my third grade teacher, Miss Leeka. She is the one who connected me with a variety of classroom 'pets' in the form of spiders, snakes, and a collection of fossils and inanimate objects from the natural world." Miss Leeka and a number of influences such as camping trips with his family and important books have inspired Doug to adopt a lifestyle and a career dedicated to caring for the Earth. What is more, his legacy is being passed on to his children. "We have two children, both of whom were raised in an environment of awareness of environmental responsibility," says Doug. "They both share the values, if not our passion, for environmental responsibility. One of our daughters has shown great interest in pursuing a career in environmental building."

The lesson in all of this is that you're not alone. Environmentally conscious teachers, scout leaders, ministers, friends, and a host of other individuals your children will interact with can have a positive influence. Some, they'll meet randomly; others they'll seek out or attract, almost magically. You can help steer your kids toward them, for example, by suggesting they enroll in environmental science in high school and college or by suggesting that they join the school's ecology club. If your child is in Boy Scouts, you might suggest they do the environmental science or natural resource conservation merit badges.

PLANET CARE: THE ULTIMATE FORM OF SELF-CARE

What we do to the planet, we do to ourselves. When we pollute the air, we pollute our own air supply. When we defile the water, we jeopardize our water supply and our own health. When we drive a species to extinction, we diminish the beauty and diversity we enjoy. You get the idea.

Planet care is the ultimate form of self-care. What we do for the planet — the acts of kindness that reduce pollution, species extinction, and resource depletion, and the improvements we make in restoring ecosystems — we also do for ourselves. Some people view these acts as sacrifice, that is, giving up the things they like or depend on.

I like to encourage individuals to think differently about environmental protection. Instead of thinking about sacrifices you need to make, that is, giving up things, it is important to think about our actions as giving *to*. Rather

than give up, we are giving to ourselves, to future generations, and the millions of species that share this planet with us, creating a cleaner, healthier, richer world. We're not detracting from our lives, we're making them richer. We're better people for it. We live conscientiously and responsibly, in some cases, so that others may live well, too.

You might like to have this conversation with your kids. It will help shape their philosophy early in life.

With this information in mind, we now turn our attention to a critical part in raising children who care for the Earth, fostering love. As Charles Dickens once wrote, "Love is the truest wisdom."

Planet care is the ultimate form of self-care.

FAMILY ACTIVITIES

Below is a list of possible activities for children of various ages. You will very likely need to tailor some of these activities to your children, simplifying them for younger children, for instance.

1. Log on to <www.airhead.org> and look up their emissions calculator. Work with your family to determine your environmental impact.
2. Obtain a copy of the *EcoTeam Workbook* or *More Fun Less Stuff* and study it with your child. Determine if you would like to follow the recommendations.
3. Log on to the website of the Center for a New American Dream, <www.newdream.com>. Set up your own personal workspace where you track changes you and your family are making — and the reductions in your impact.
4. Read the "Kids Who Are Making a Difference" piece in this chapter aloud to your children. Be sure your spouse joins in. Discuss the project and other projects they could start at school or in the community.
5. Read the "Models of Sustainability" piece in this chapter aloud to your family and discuss it. Be sure they understand global warming and global climate change. Make a list of its impacts. Make a list of things your family could do to reduce their contribution to global climate change.
6. While on a trip or after dinner, make a list of all the ways the environment benefits you and your family.

Sample file