HOW TO CHANGE EVERYTHING

THE YOUNG HUMAN'S GUIDE TO PROTECTING THE PLANET AND EACH OTHER

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INTRODUCTION
At the Reef

I spent a lot of time underwater as a kid. My father taught me to snorkel when I was six or seven, and those are some of my happiest memories. I was a shy child and often felt self-conscious. The one place where I never felt that way, where I always felt free, was in the water. Meeting ocean life so closely always amazed me.

When you first swim up to a reef, the fish mostly scatter. But if you hang out for a few minutes, breathing quietly through your air tube, you become part of the seascape to them. They'll swim right up to your mask, or gently nibble your arm. I always found these moments wonderfully dreamlike and peaceful.

So when I went to Australia for work years later, I decided to try to give my four-year-old son, Toma, the kind of undersea experience I had loved as a child. I wanted to show him that although the surface of the sea might look unremarkable, you can see a whole new and colorful world when you look beneath the surface.

Toma had just learned to swim, and we were about to embark on my first-ever visit to the Great Barrier Reef, the largest structure on Earth made up of living things—trillions of tiny coral creatures. The timing seemed perfect.

We went to the reef with a film crew and a team of scientists who had been studying the reef. I wasn't sure that Toma would be able to focus on the coral at all, but he had a flash of true wonder.

He "saw Nemo." He saw a sea cucumber. I think he even saw a sea turtle.

That night, when I tucked him into bed in our hotel room, I said, "Today is the day when you discovered there is a secret world under the sea." He looked up, and the pure happiness on his face told me he understood. He said, "I saw it." I felt a mixture of joy and heartbreak, because I knew that just as he was discovering the beauty of our world, it was draining away.

You see, the Great Barrier Reef was the most stunning place I had ever seen. It was a riot of life everywhere. Sea turtles and sharks swam past brilliantly colored coral and fish. But the reef was also the most frightening thing I had ever seen, because large parts of it—the parts I didn't show Toma—were dead or dying.

Those parts of the reef were a graveyard. As a journalist who had been reporting on climate change and the environment, among other subjects, I had come to the reef to write about it. I knew what was happening.

A reef-killing event called a mass bleaching had the Great Barrier Reef in its grip. Bleachings happen at times of high water temperature. The living corals turn ghostly and bone-white. They can return to normal if temperatures quickly go back down to lower levels. In the spring of 2016, though, temperatures had stayed high for several months. A quarter of the reef had died and turned into a brown goo of decay. At least another half of it had also been affected to some extent.

The water of the Pacific Ocean didn't have to warm very much to cause this massive die-off at the Great Barrier Reef. Ocean temperatures went up just 1.8 degrees Fahrenheit, or 1 degree Celsius, past the levels at which these corals can live. The dead and dying parts of the reef I saw were the result.

Corals are not the only things affected by bleachings like the one I saw. Many species of fish and other creatures depend on coral for food or habitat. Food and income for a billion or so people

around the world come from the fish that depend on coral reefs. When reefs die, the loss reaches far. Sadly, more reefs are dying. That's because temperatures are rising everywhere, not just at the Great Barrier Reef, and these rising temperatures are changing our world. This book is about that change. It is about why temperatures are rising, how their rise is altering the climate and harming the planet we all share, and—most important—what we can all do about it.

The vibrant undersea world of a healthy coral reef.

Coral bleached by warming water will die and turn brown if the water does not cool. And once a reef dies, its web of life will eventually collapse.

What we can do goes far beyond making our individual efforts to reduce the pollution that's changing our climate. We do need to act against climate change to protect the natural world and the planet that supports all life, but we can go further than that.

Many things about climate change are unfair. One of them is the way it is stealing a healthy, clean planet from young people like my son, Toma. And from you.

It is also unfair that climate change affects people unevenly. Poorer communities, and minority communities, often suffer more than others from its effects. So this book is also about justice, or fairness. It is about how our response to climate change can help create not only a less polluted world but a more just one for all of us who share it.

You and your generation, and the generations yet to come, have done nothing to create the crisis of climate change, but you will live with the worst effects of it—unless we change things.

I wrote this book to show you that this change for the better *is* possible. Then, just as I was finishing the book, the world confronted a sudden, unexpected crisis. A new contagious disease known as a novel coronavirus appeared.

In early 2020 the virus grew into a pandemic, a disease that affected people in nearly every country. Rates of sickness and death were tragically high. Millions of people had to change their ways of life, staying home and avoiding other people, to slow the spread of the virus. Schools closed in many countries, throwing kids into a new routine of learning at home while missing their friends.

At the end of this book you'll find what I think we can learn from this shared worldwide experience. But as you read the following chapters, keep in mind that the coronavirus pandemic did not halt climate change—or the movement to bring climate change under control.

That movement is under way now. Its goal is to fight climate change while also making a fair and livable future possible for *everyone.* This is called climate justice. And young people are not just part of that movement. They are leading the way. Will you be one of them?

I hope this book will help you answer that question. It is meant to give you information and much more: inspiration, ideas, and tools for action.

First you'll see some of the steps that kids like you are taking against climate change and for social justice, including racial, gender, and economic justice. After that you'll dive into what we have learned about the state of the climate now, and how we got here. Then you can help decide what happens next. You won't be alone. In these pages you'll meet some of the young activists from all over the world who are working to protect our planet *and* win climate justice.

It can be scary to look closely at the realities of climate change, but don't let the facts overpower you. Remember that they are only part of the story. The rest of the story—the part of it that has fired up hundreds of thousands of young people like you in all parts of the world—is that we have choices. The huge uprisings

against racism and for climate action show us that millions are hungry for change. We can build a better future, if we're willing to change everything.

Part One

WHERE WE ARE

CHAPTER 1

Kids Take Action

They streamed out of their schools, bubbling with excitement. Little trickles of them flowed from side streets into grand avenues, where they mingled with other streams of children and teens. Chanting, chatting, dressed in everything from crisp school uniforms to leopard leggings, the kids formed rushing rivers in dozens of cities around the world. They marched by the hundreds, thousands, and tens of thousands.

Did businesspeople gaze down from their office windows and wonder what so many kids were doing out of school? Were shoppers puzzled by the surging excitement on the streets? Signs carried by the marchers answered those questions:

One of New York City's ten thousand young marchers was a girl who held up her painting of bumblebees, flowers, and jungle animals. The painting was lush, but the words with it were harsh: 45% OF INSECTS LOST TO CLIMATE CHANGE. 60% OF ANIMALS HAVE DISAPPEARED IN THE LAST 50 YEARS. At the center she had painted an hourglass running out of sand.

That day in March 2019 was the first global School Strike for Climate.

STUDENTS ON STRIKE

Organizers of the first school strike estimate that there were almost 2,100 youth climate strikes in 125 countries that day. More than a million and a half young people showed up. Most of them had walked out of school—some with permission, some without—either for an hour or for a whole day.

Many of them took to the streets because they recognized a deep conflict in what they were learning about the world. Schoolbooks and documentaries had shown them ancient glaciers, dazzling coral reefs, and other living things that make up our planet's many marvels. But at almost the same time, they were finding out that much of this wonder has already disappeared because of climate change. Much more would be gone if they waited until they were grown up to do something.

Learning about climate change had convinced these kids that things could not continue on the same path. So, like many groups before them who had fought to transform the world, they took to marching.

But many of these young people went on strike not just to prevent losses in the future but because they were already *living* in a climate crisis. In Cape Town, South Africa, hundreds of young strikers chanted at their elected leaders to stop approving new projects that would contribute to our planet's warming. A year earlier, the huge city had come desperately close to running out of water, after several years of low rainfall and severe drought that were likely caused—or at least made worse—by climate change.

In the Pacific island nation of Vanuatu, young strikers yelled, "Raise your voice, not the sea level!" Their Pacific neighbor, the Solomon Islands, had already seen five small islands covered by

the sea, which is rising as higher temperatures cause water to expand and glaciers and ice sheets to melt.

"You sold our future, just for profit!" the students in Delhi, India, yelled through white medical masks. Delhi often has some of the worst pollution in the world, in part because India is a major user of coal, a fuel that produces pollution. But the clouds of smog that form visible air pollution are not the only problem with coal. Burning it also releases invisible substances called greenhouse gases into the air. And as the student marchers there knew, and as you will see, these gases are the reason our climate is changing.

Hope, determination, and a bouncing globe filled the air as young people filled the streets in Sydney, Australia, during the first School Strike for Climate.

That day was the first-ever worldwide climate strike—and it was created and run by kids. With that first school strike and those that have followed it, young people around the world are demanding a say in the future of their world.

"We Deserve Better"

One hundred and fifty thousand young people poured into the streets of Australia's cities for the first School Strike for Climate. They knew that climate change was already damaging their nation. One of its effects, as you saw at the beginning of this book, is that warming ocean water is killing the Great Barrier Reef, a natural treasure of Australia and the world.

Yet Australia remains a major producer and seller of coal. And coal, when burned as fuel to power electrical plants and for other uses, produces the greenhouse gases that drive temperatures higher. Fifteen-year-old Nosrat Fareha, an Australian strike organizer, said to the country's political class, "You have failed us all so terribly. We deserve better. Young people can't even vote but will have to live with the consequences of your inaction." Like other young people in other cities, Fareha was unafraid to speak the blunt truth to those in power. That fearlessness is one of the strengths of the youth movement for change.

A SCHOOLGIRL IN SWEDEN

The School Strike for Climate in March 2019 showed the world a youth movement that was large and growing. It had begun largely thanks to a fifteen-year-old girl in Stockholm, Sweden.

Greta Thunberg started learning about climate change when she was eight years old. She saw documentaries about melting glaciers and disappearing species. She learned that burning fossil fuels such as coal, oil, and natural gas emits—or releases—greenhouse gases into the atmosphere, and those gases contribute

to climate change. Power plants, chimneys and smokestacks, cars, and planes all add greenhouse gas emissions to the air.

Meat-based diets also increase greenhouse gases, Greta learned. That's because raising livestock, especially cattle, means cutting down large amounts of forest to create grazing lands. This deforestation removes trees, and trees absorb the harmful greenhouse gas known as carbon dioxide, taking it out of the atmosphere. In addition, cattle and their manure add methane, another greenhouse gas, to the air.

As Greta grew older and learned more, she focused on scientists' predictions about what Earth will be like in 2040, 2060, and 2080 if humans do not change our ways. She thought about what this would mean to her own life—the disasters she would have to endure; the animals and plants that would disappear forever; the hardships in store for her own children, if she decided to become a parent.

But she also learned that the worst predictions of the climate scientists were not set in stone. By taking bold action now, humans can sharply increase the chances of a safe future. We can still save some of the glaciers. We can protect many island nations from being swallowed by the sea. We might avoid massive crop failures and unbearable heat that would send millions or even billions of people fleeing from their homes.

Why, Greta wondered, wasn't everyone talking about *preventing* climate disaster? Why weren't nations such as hers leading a dramatic charge to lower greenhouse gases? The world was on fire, yet everywhere Greta looked, people were still going about their lives, buying new cars and new clothes they didn't need, as though nothing were wrong.

At around the age of eleven, Greta fell into a deep depression. One reason she could not shake off her depression is that Greta has a form of autism that causes her to focus intently on subjects that interest her. So when Greta turned her laser-like attention to the

climate breakdown, she saw and felt the full meaning of the crisis. She could not be distracted from it. Fear and grief for the planet overwhelmed her. Depression is complex, and there were other factors too. But it was impossible for Greta to understand why those in power were not doing much about the crisis of climate change. Weren't they also scared and angry?

A big part of coming out of her depression was finding ways to close the unbearable gap between what she had learned about the causes of the climate crisis and how she and her family lived. She convinced her parents to stop eating meat and to stop flying. The most important change for her, though, was finding a way to tell the rest of the world that it was time to stop pretending everything was fine. If she wanted powerful politicians to treat the fight against climate change as an emergency, she figured that her own life had to express that state of emergency too.

So in August 2018, at the age of fifteen, Greta didn't go to class when school started. Instead she went to Sweden's center of government and sat outside with a handmade sign that read SCHOOL STRIKE FOR CLIMATE. She spent every Friday there, in her thrift-shop hoodie and light brown braids. This single action was the beginning of the Fridays for Future movement.

Greta Thunberg, a solitary Swedish schoolgirl, launched a movement that would reach every part of the world.

Public protest can be a powerful way to make a statement, but protest doesn't always make things happen overnight. At first people ignored Greta as she sat with her sign. Gradually, though, her protest got a bit of attention in the news. This caught the eyes of people who understood what she was trying to communicate, who agreed with her and also wanted to make a statement. Other students, and a few adults, started showing up with signs. Soon

Greta was being asked to speak at climate rallies, then at United Nations climate conferences, and to the leaders of the European Union, the British Parliament, and more.

Greta has said that people with her kind of autism "aren't very good at lying." She speaks in short, sharp truths. "You are failing us," she said to world leaders and diplomats at the United Nations in September 2019. "But the young people are starting to understand your betrayal. The eyes of all future generations are upon you. And if you choose to fail us, I say, we will never forgive you. We will not let you get away with this. Right here, right now is where we draw the line. The world is waking up. And change is coming, whether you like it or not."

Even if Greta's speeches brought no dramatic action from world leaders, her words electrified many others. People shared videos of her on social media. They talked about how she'd inspired them to face their own fears about the climate future and to take action. Suddenly children around the world took their cues from Greta. They organized their own student strikes. Many held up signs with her words: I WANT YOU TO PANIC. OUR HOUSE IS ON FIRE.

In December 2019, *Time* magazine named Greta Thunberg its youngest-ever Person of the Year for her activism in calling attention to the climate crisis. Yet she gives credit to other young activists who were *her* inspiration—students in Parkland, Florida. After seventeen people were murdered at their school in February 2018, Parkland students led a national wave of class walkouts for gun control. By following their example, Greta helped to bring the youth climate change movement to the world's stage, and by following her example, thousands more kids just like you have committed themselves to halting the dangerous progression of climate change.

Greta's Superpower

Living with autism isn't easy. For most people, says Greta, it "is an endless fight against schools, workplaces and bullies. But under the right circumstances, given the right adjustments, it *can* be a superpower."

And this is why Greta credits her autism for her clear vision of the problem and her power to speak clearly about it. "If the emissions have to stop, then we must stop the emissions," she says. "To me that is black or white. There are no gray areas when it comes to survival. Either we go on as a civilization or we don't. We have to change."

Learning about the ways our climate is changing can lead to sadness, anger, or fear. But Greta discovered that she could help deal with those feelings by taking action and making a public stand—and when she did that, she became someone for many others to stand beside. Like the tiny piece of sand inside an oyster that causes a pearl to form around it, Greta's small act of protest helped create something beautiful and strong.

A LAWSUIT FOR CHILDREN'S RIGHTS

Young people are not just taking the climate movement to the streets. They are also taking it into the courts. Can they use international law to fight climate change? Sixteen kids from twelve countries on five continents are going to find out.

In September 2019 these climate activists, ranging from eight to seventeen years old, filed a legal complaint with the United Nations under an international treaty called the UN Convention on the Rights of the Child. This treaty took effect in 1989 to protect children's rights in the countries that signed it. It says, among other things, that every child has the "right to life" and that governments "shall ensure to the maximum extent possible the survival and development of the child."

The next chapters will give you a closer look at the climate crisis and its causes. You'll see what is driving so many kids like you to devote themselves to changing the world for the better.

CHAPTER 2

World Warmers

On Christmas Eve 2019, Antarctica got an unwanted gift—a new record. The ice-covered continent set a record for the most ice melted in a single day. Ice had turned to water on 15 percent of Antarctica's surface. But it hadn't been just one warm day.

December is summer in Antarctica, the melting season, because seasons in the southern half of the world are the opposite of those in the northern half. But even in summer, so much ice had never melted so quickly before. By Christmas, the summer meltwater level had been 230 percent higher than average for a month. Why? One scientist said that the continent had been "significantly warmer than average" all season.

Photos taken just nine days apart in February 2020 show how much ice had melted at the tip of the Antarctic Peninsula after record high temperatures.

At the same time, far to the north, where December falls in winter, the Russian city of Moscow had a different, but related, problem: no snow.

For centuries, Moscow has been known for its winters. They are often bitterly cold, and snow usually falls before the end of the year. But in December 2019, temperatures were higher than normal. Gardens bloomed early. Children used ice rinks for soccer matches because there was no ice for hockey. City officials had to truck in tons of fake snow for a New Year's Day snowboarding event.

And while this fake snow piled up in Moscow, unusual warmth was leading to climate tragedy half a world away. On the last day of 2019, thousands of people in southeastern Australia fled to beaches to escape the flames that were tearing through their homes and communities.

Even though the southern summer was just getting started, already Australia was in the grip of yet another terrible heat wave. After three years with much less rain than usual, large areas were deep in drought. Trees and plants were bone-dry, ready to ignite. And they did. Small fires—started when lightning struck a dry tree or when people lit campfires, burned trash, or tossed cigarettes—quickly erupted into massive fires that sped through areas of dry vegetation. Plants were not the only things that burned, however. As happens with many wildfires around the world, homes, businesses, and other human-built structures were destroyed or damaged as well.

Perhaps the huge fires should not have been surprising. Just under a year earlier, Australia had started 2019 with its worst heat wave ever. In some places, temperatures had soared to above 104 degrees F (40 degrees C) for more than forty days in a row. Then, too, fires had wreaked havoc. They'd destroyed vast stretches of ancient forest in the Australian state of Tasmania, which had had the driest January ever recorded.

this polar jet stream twists southward, it carries frigid polar air and bitter winter weather with it. This helps explain why a planet that is getting hotter on average can still have extreme cold-weather events in some places.

And our planet *is* getting hotter. Sometimes this is called global warming, but "climate change" is a more useful term. That's because not every part of the world is warming all the time. The rising temperature of our planet is an overall average.

Heat waves and storms have always happened. So have cyclones, floods, and wildfires. Now, though, we know that the warming climate is fueling extreme conditions (such as drought) and extreme weather (such as megastorms). Climate change makes deadly, destructive natural events more likely.

But climate change isn't just about new weather records or numbers on a thermometer. The warming of the world also brings many smaller, creeping changes to plants and animals, oceans, and more. In this chapter you'll see what scientists have learned about the world's rising temperature and the changes that result. They are still working to fully understand these big and small changes, but the changes will touch the lives of all of us, and all life that shares our planet.

A tornado left a trail of destruction in Joplin, Missouri, in May 2011. Climate change will likely make such extreme weather disasters more frequent and severe.

This is called climate disruption—climate change that disrupts, or breaks up, the way things have been all over the world. It brings new conditions that can be hugely destructive. The good news is that we know what is causing climate change. And because we have this knowledge, we also know what we can do to slow it down or stop it.

EARTH TODAY

Wherever in the world you live, you and other young people today have something in common. You are seeing climate disruption happen and worsen as you grow up.

During the twentieth century, the temperature across all the world's land and sea surfaces averaged 57.0 degrees Fahrenheit (13.9 degrees Celsius). In early 2020, the US National Oceanic and Atmospheric Administration (NOAA) reported that the global average temperature in 2019 had been 1.71°F (0.95°C) warmer than that. In fact, 2019 was Earth's second-warmest year on record,

has known for the past twelve thousand years or so. Those conditions are changing rapidly. Keeping up with them will be the biggest challenge our civilization has faced.

But the key difference between today's climate crisis and the ancient climate changes is that *we* are causing this one. National Aeronautics and Space Administration (NASA) researchers report that much of the current warming trend, maybe all of it, is human-caused: "Most of it is extremely likely (greater than 95 percent probability) to be the result of human activity since the mid-20th century."

Our actions—burning fossil fuels, but also cutting down forests and raising a lot of livestock to eat—are changing the atmosphere in a way and at a speed that is outside its natural course. These activities of ours are adding greenhouse gases to the atmosphere.

A greenhouse is a building that traps and holds heat, so that people can grow flowers or fruits inside it even when the weather outside is too cold. Greenhouse gases work the same way, but on a global scale.

A lot of the heat energy that reaches Earth from the sun reflects off the planet and back into space. Certain gases in the atmosphere, though, trap some of that heat near the planet's surface. When those gases increase, more heat is kept, and temperatures go up. The rising temperatures, in turn, lead to the droughts, storms, wildfires, melts, and other features of our current climate crisis.

Our modern way of life is constantly emitting these heat-keeping greenhouse gases into the air. This means that we are constantly heating the planet in a way the Earth has never seen before.

You'll find out more about the links between human activity, energy use, greenhouse gases, and climate in chapter 4. First, though, you deserve to learn who is at greatest risk if we continue