ENVIRONMENTAL JUSTICE!

How can we create environments that are healthy for everyone?

SUSTAINABLE DEVELOPMENT G⦿ALS

developed by

Smithsonian
Science Education Center

in collaboration with

iap SCIENCE HEALTH POLICY
the interacademy partnership

Throughout the Smithsonian Science for Global Goals community research guides we have included quotes from many different individuals. These quotes represent the personal and professional perspectives of each individual and were not edited. We recognize that individuals have unique perspectives, experiences, ways of knowing, and expertise.

Smithsonian
Science Education Center

Dear Parents, Caregivers, and Educators,

As a global community we face many challenges. At times, these worldwide problems can seem overwhelming. We may ask ourselves questions about how to understand these complex problems and whether there's anything we can do to make them better. This community response guide encourages young people to discover, understand, and act on the answers to these questions.

In the years leading up to 2015, people around the world worked together to share their ideas about how our world should be. These ideas became a list of goals, the United Nations Sustainable Development Goals. The goals represent a plan for a sustainable world: a world where peaceful societies collaborate; a world where we live in balance with the environment of our planet; a world in which our economies fulfill our needs; a world that is fair to all.

As youth around the globe engage with the activities in this guide, they will gain an understanding of the science that underlies the Sustainable Development Goals. They will be able to share their knowledge with their community, create tangible ways to help their community make informed decisions, and understand the best places to find additional information on these topics.

Throughout the guide, young people may find themselves asking many questions about fair treatment of people and communities. You do not need to have the answers to any of these questions. The most important thing you can offer young people is the opportunity to question, investigate, think critically and systemically, synthesize, and act. Ask the young people around you how they are feeling and what they are thinking about as they learn this content.

I am immensely grateful to the experts who helped to develop this guide—the InterAcademy Partnership (IAP), a collaboration of 140 national academies of sciences, engineering, and medicine; our colleagues across the Smithsonian Institution; and the external subject matter experts who contributed to this guide—for their perspectives and technical support in ensuring the science in this guide is accurate. I also want to say a special thank you to the developer of this guide, Heidi Gibson, for her thoughtful contributions to the *Smithsonian Science for Global Goals* project.

Working together—scientists, researchers, parents, caregivers, educators, youth—we can make a better world. This guide is a step toward that grand collaboration.

Thank you for partnering with us to inspire our youth to build a better world.

Best,

Carol L. O'Donnell

Dr. Carol O'Donnell, Director
Smithsonian Science Education Center

Find out More!

For additional resources and activities, please visit the *Environmental Justice!* StoryMap at https://bit.ly/3tM4bVE.

Student Letter

Dear Student,

This is the last time you will be called a student in this Community Response Guide. Instead, you will take on a new role as an action researcher. Action researchers are interested in figuring out what to do to make their communities better. They use scientific investigations to help understand the natural world around them. They use social science investigations to help understand the people, cultures, and history of their communities. Then they use the information they gather to help solve problems in their own communities. This guide will help you learn more about this process. The most important thing to know is that you will control your own research and make your own decisions.

Think back to a time when you solved a problem. You first needed to know what you wanted, your goal. Then you had to figure out what you needed to do to achieve your goal. This guide is similar. You will think about goals you have for your local community, then figure out what you need to take action to help reach those goals.

You and your classmates will work as a team to think about information you already have about the place where you live. Then you will investigate your local community and how things work. Finally, your team will decide how to make things better. Together you will put your decision into action. Sometimes, making decisions about what to do is difficult. Don't worry, this guide will give you lots of support.

How to Use this Guide

This guide is designed to help you explore and think about problems in your community. The guide is here to help you. That means you can always change it.

Adapting the Guide

You will notice that in this guide there are often suggestions of different ways to share your ideas or do investigations. This is because different people think and work best in different ways. For example, some people like to draw, some people like to talk out loud, and some people prefer to write to express their ideas. This guide has suggestions, but you can always change the method suggested. You can share your ideas using discussions, acting, signing, telling stories, recording your voice, writing by

hand, typing on a computer, drawing, or another way you choose. Think about the way you and your team learn best together. Including everyone on the team is important.

Safety Tips

This guide asks you to do and think about things that may seem unfamiliar. You will notice physical and emotional safety tips in the guide. These will help you stay safe and supported during the activities. Make sure you follow your teacher's directions about staying safe.

Guide Structure

There are eight tasks in this guide. Each task has three activities. The activities are called **_Discover_**, **_Understand_**, and **_Act_**. In the **_Discover_** activities you will focus on thinking about information that you and your team already know. In the **_Understand_** activities you will investigate to find out new information. In the **_Act_** activities you will put your existing and new knowledge into action by applying it and making decisions. Words that may be unfamiliar will be in **bold** the first time they are used. Then at the end of the guide a glossary lists the definitions of these words.

Investigations

You are the one doing the research in this guide. This means often you will develop your own questions and determine the best way to answer them. Developing and answering questions is how scientists find out new information about the world around them. As an action researcher, you need to think like a scientist to discover what you need to know, investigate to find out more information, and think about the meaning of what you found out. In many activities there are resources to give you more information and help you investigate in the _Environmental Justice!_ StoryMap website found at https://bit.ly/3tM4bVE.

Keeping Organized

In this guide you will have some papers you will need to keep so you can look at them later. You may want to have a folder, notebook, or science journal to help you stay organized. To make sure this isn't confusing, here is a list of papers you will create and refer back to as you work through the guide.

Identity Map (Task 1, Discover activity)
Notice, Think, Wonder (Task 1, Understand activity)
My Healthy Environment (Task 1, Act activity)
Justice Reflection (Task 2, Discover activity)
Environmental Problems (Task 4, Discover activity)
Causes Analysis (Task 5, Understand activity)
Community Identity Map (Task 6, Understand activity)
Action Plan (Task 8, Understand activity)

Teams

You will be working with other classmates as part of a research team. Your team will conduct investigations and make decisions together. When conducting research, there may be many things to figure out as a team. You will need to be creative. There will not always be a clear right and wrong answer. Sometimes the team might not agree. This is okay. Just make sure to respect your teammates. There is no one right answer to the problems faced by your community. There is just the right answer for you and your team.

Getting Started

You will be thinking about complex problems. Sometimes this can feel difficult. Be patient. You will be guided to consider different parts of the problem. By the time you are making big decisions, you should have lots of information. Always remember, your work is important. Decisions you make can change your community. You are an important part of making your local and global communities better.

Thank you for working to make your community better.

The Smithsonian Science for Global Goals team

Environmental Justice Guide Planner

Timing note: *The time required for investigations, observations, and actions can vary. When different options are listed within an activity, some options may take longer than others.*

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Task 1: What is my relationship with my environment?					
Discover	Develop a personal identity map showing the different parts of who you are. Compare with teammates.	• Paper • Pens or pencils • Objects that represent you (optional)		25 minutes	1
Understand	Observe what you can notice about your inside or outside environment.	• Paper • Pens or pencils		40 minutes	4
Act	Imagine a healthy environment and consider how you want to relate to your environment.	• Paper • Pens or pencils	*Notice, Think, Wonder* (Task 1) *Identity Map* (Task 1)	20 minutes	7
Task 2: What is environmental justice?					
Discover	Consider the meaning of justice and different perspectives on what makes situations just or unjust.	• Paper • Pens or pencils • Class board or poster paper	*Justice Reflection* (Task 2)	50 minutes	11
Understand	Explore the effect of the environment on people and the effect of people on the environment.	• Beanbag, soft ball, or similar item • Paper • Pens or pencils	*Justice Reflection* (Task 2)	30 minutes	16
Act	Create and share a team definition of environmental justice.	• Class board or poster paper • Pens or pencils • Other communication tools	*Justice Reflection* (Task 2)	15 minutes + action time	20

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Task 3: How does the environment affect health and well-being?					
Discover	Connect healthy and unhealthy environments with different health conditions and the Sustainable Development Goals.	• Pens or pencils • Paper	*My Healthy Environment* (Task 1) *Justice Reflection* (Task 2)	25 minutes	24
Understand	Research health statistics for your local area.	• Pens or pencils • Paper	*Justice Reflection* (Task 2)	25 minutes + investigation time	27
Act	Explore collective action and communicate to show connections between local issues and Sustainable Development Goals.	• Paper • Pens or pencils • Other communication tools	*Justice Reflection* (Task 2)	20 minutes + action time	33
Task 4: What environmental problems is my community experiencing and why?					
Discover	Interview community members or use alternate methods to identify environmental problems and their impacts in your local environment.		*Justice Reflection* (Task 2)	25 minutes + investigation time	37
Understand	Choose one or more investigations to collect data about local environmental issues.	• Pens or pencils • Paper • Specific investigations may need additional items	*Justice Reflection* (Task 2) *Environmental Problems* (Task 4)	15 minutes + investigation time	43

Guide Planner

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Act	Determine how to use data or storytelling to tell others about a problem.	• Paper • Pencils	*Environmental Problems* (Task 4)	15 minutes + action time	56
Task 5: What is causing environmental issues?					
Discover	Use a case study to explore direct and systemic causes.	• Paper • Pens or pencils	*Justice Reflection* (Task 2)	20 minutes	59
Understand	Choose one or more investigations about the causes of an environmental problem you pick.	• Pens or pencils • Paper • Specific investigations may need additional items	*Environmental Problems* (Task 4) *Justice Reflection* (Task 2)	15 minutes + investigation time	63
Act	Use a role-play activity to explore finding sustainable actions.	• Paper • Pens or pencils	*Justice Reflection* (Task 2)	25 minutes	69
Task 6: How are the impacts of environmental problems unjust?					
Discover	Explore the idea of discrimination and develop a collaborative piece of artwork about injustices.	• Paper • Pens or pencils	*Justice Reflection* (Task 2) *Environmental Problems* (Task 4)	25 minutes	72
Understand	Research the people of your community and inclusive community decision-making.	• Pens or pencils • Paper	*Identity Map* (Task 1) *Justice Reflection* (Task 2)	20 minutes + investigation time	75
Act	Use past examples of environmental justice actions to identify possible action partners.	• Paper • Pens or pencils	*Justice Reflection* (Task 2)	25 minutes + action time	77

Guide Planner

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Task 7: What can be done?					
Discover	Explore the role of different groups in helping or hurting environmental justice efforts.	• Paper • Pens or pencils	*Environmental Problems* (Task 4)	20 minutes	85
Understand	Explore and create STEM and policy innovations to help solve your environmental problem.	• Pens or pencils • Paper		30 minutes + investigation time	87
Act	Research other young activists and share inspiring stories with others.	• Paper • Pens or pencils • Internet access (optional)		35 minutes	88
Task 8: How will we act?					
Discover	Decide on the action your team will take.	• Paper • Pens or pencils	*Identity Map* (Task 1) *Causes Analysis* (Task 5)	25 minutes	90
Understand	Develop an inclusive action plan.	• Pens or pencils • Paper		25 minutes	93
Act	Implement your action and reflect.	• Paper • Pens or pencils		15 minutes + action time	95

*StoryMap extension found at https://bit.ly/3tM4bVE

Guide Planner

Environmental Justice!
How can we create environments that are healthy for everyone?

In this guide you will become an **action researcher** to identify and help solve problems in your community. Action researchers first *discover* their own existing knowledge, then they *understand* problems through investigations, and finally they *act* on what they have learned to make local and global communities better. You will be creating and keeping several sheets of paper or digital documents to help you record and remember information. You may want to use a notebook or folder to help organize the sheets you will use in the guide. If you get confused, the list of sheets is found in the Student Letter at the beginning of the guide.

Remember: In this guide you and your team are in charge. You can always change the instructions in the steps to make them work better for you and your team.

Task 1: What is my relationship with my environment?

Who we are affects the way we think about and interact with the people and places around us. In this task you will first *discover* more about your own identity and opinions. Then you will *understand* more about your **surroundings**. Finally, you will *act* to establish the kind of relationship you want with your environment.

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Discover: What is my identity and how does it relate to my perspective?

Our different experiences, backgrounds, and ideas give each of us a unique identity. Your identity is what makes you you. Our different identities often lead to different **perspectives**. Perspectives are the way we think about the world around us. Understanding your own identity and perspective can help you understand other perspectives. This activity will help you think about your own identity.

1. Take out a piece of paper and title it "Identity Map." If you prefer, you can make an identity map using objects or digital tools. There are more details about how to do that in step 6.

2. On the paper, write your name in the center of the page or draw a small picture of yourself.

3. Draw a circle around your name or picture.

4. Answer the question, "Who am I?" or, "What describes me?" The list below can give you some ideas to consider, but you choose what you want to include. You can also include things that are not on the list. Record anything you can think of that is important to who you are.
    - Age
    - School or class
    - Race and/or ethnicity
    - Gender
    - Country or place where you live
    - Country or place that is important to you or your family
    - Ideas or beliefs that are important to you
    - Topics or subjects that interest you
    - Hobbies or things you like to do for fun
    - Physical traits (such as tall, black hair, blue eyes, wears glasses)
    - Personality traits (such as loud, funny, sad, kind)
    - Roles you have in your household (such as big sister, helper, cousin)
    - Groups you belong to

5. Write each answer on the page around your name. Draw a line between your name and each answer. Figure 1 is an example of a written _Identity Map_. You can put your answers at the end of each line.
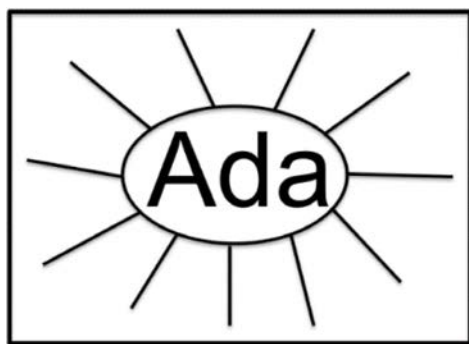
Figure 1: Example of a written identity map.

6. If you prefer, you can use objects around your home to create your map. To keep your map, you can take a picture or just remember it. Figure 2 is an example of an _Identity Map_ using objects. You could also make a digital map using recordings or photos.

Figure 2: Example of an Identity Map using objects.

7. Now form a team. As action researchers you will work together with your team made up of your classmates for the rest of this guide. You will work together to understand your local area and make it better. Your team may be your whole class, or it may be a smaller group. Either is fine.

8. Find out what you have in common with your team. Try to find matching identities with your teammates. For example, if you like to read for fun, see if you can find someone else who likes to read for fun. Find a few matching identities. Then move on to the next step.

> ⚠️ **Emotional Safety Tip**
>
> Sharing your identity with someone else can help build trust between you and that person. But it can be hard to share your personal identity with someone else. Only share parts of your Identity Map that you feel comfortable talking about.

9. Now try to find teammates who have different identities than you. Find a few people who have different identities. Then return to your place. Everyone is unique. It is good to have different identities as part of your team. This means you

have different information to share. As action researchers, you will work together as a team to find the best way to take action on the problems you identify. The different identities and experiences of each member of your team will help you make better decisions. For example, if you were born in the place where you live but your teammate was born somewhere else, you each may know different things.

10. Read *Guidelines for Team Discussion*. Then, as a team, discuss:

    a. How did you feel when you found teammates with matching identities?

    b. How did you feel when you found teammates with different identities?

    c. Imagine if one thing about your identity was different. How might it change your daily life?

Guidelines for Team Discussion

- Remember, listening to many different perspectives and viewpoints is good.
- Open yourself to new ideas.
- Differences in your team can be useful. People with different identities can bring new knowledge and ideas.
- Actively listen by facing the person and show them you are paying attention.

Understand: *How does my environment affect me?*

Each of us is unique. We have different experiences. Many of our experiences are related to the **environment** around us. In this activity you will start to consider the effect of the environment on you and your life.

1. Read *What Is the Environment*?

What Is the Environment?

The environment is the conditions and things that surround us. The environment includes conditions and things made by people and natural systems. Part of the environment is things created by people, such as roads and houses, and conditions created by people, like a feeling of love or social belonging. This human-created environment is part of the larger natural environment. The natural environment includes all living things. It includes systems like the ones that create rocks and the weather. The natural environment is not created by people, but people can harm or protect the natural environment.

The environment includes the conditions and things very near to you, like the ones found in your home, school, and neighborhood. The environment also includes things and conditions all around the world.

Figure 3: The global environment, seen from space.

Sometimes it might be helpful to think about the local and global environments or the human-created and natural environments separately. But these environments cannot really be separated. They are all are connected. You are part of the environment, and the environment is part of you.

In this guide, when you think about your environment you will be thinking about both the human-created environment and the natural environment.

2. Take a sheet of paper or open a digital document and divide it into three columns. Label the first column "Notice."

3. Find a spot indoors where you won't be distracted.

4. Close your eyes. You first will use your other senses to observe your environment.

> ⚠️ **Emotional Safety Tip**
>
> Some members of your team may not want to or be able to use all of their senses. This is not a problem. There are many ways to notice your environment.

5. Pay close attention to what you are experiencing right now. What do you hear? After a few moments, open your eyes and write or draw your answers in the *Notice* column.

6. Repeat with the next two questions.

   a. What do you smell and taste?

   b. What do you feel with your sense of touch?

7. Now open your eyes. What do you see? Write or draw your answers in the *Notice* column.

8. Find a spot outdoors.

9. Do steps 4 through 6 again.

10. Label the next column "Think."

11. Think about everything you noticed both indoors and outdoors. Then answer the following questions. Write or draw your answers in the *Think* column. Be sure to consider:

    a. Are there things you noticed that make it easier for you to be healthy and happy?

    b. Are there things you noticed that make it harder for you to be healthy and happy?

12. Label the final column "Wonder."

13. Consider any questions you have about the things you noticed. Write or draw those questions in the *Wonder* column. For example:

    a. Questions about why your environment is the way it is.

    b. Questions about how your environment affects you or other people.

    c. Questions about how you might affect your environment.

Act: *What would I like my relationship to be with my environment?*

The environment can play an important part in human health and well-being. A healthy environment makes it easier to be healthy and happy. An unhealthy environment can make it harder to be healthy and happy. People can make choices and act to keep the environment healthy for their **community**. A community is a group of people who have something in common, like sharing the same local area.

1. Examine your *Notice, Think, Wonder* sheet. Think quietly to yourself. Were there any things you noticed that you thought had a negative effect on you? Circle these ideas on your paper.

2. Think about the ideas you circled.

    a. What would need to change for your environment to have a positive effect instead of a negative one?

    b. For example, maybe you noticed that the air smelled bad in your environment. This had a negative effect on you because it made you not want to go outside. In this example, what would need to change to make you want to go outside?

3. Get out another sheet of paper or open a digital document. Title it "My Healthy Environment."

4. Draw or write your ideas on the paper about what a healthy environment would include. Be sure to consider:

    a. Your circled ideas from the *Notice, Think, Wonder* sheet about what in your environment could make it easier to be healthy and happy.

    b. Other parts of an imagined environment that you would like to live in. What would a healthy environment include?

5. Share your ideas with your teammates. Did anyone else have any ideas you want to include on your sheet? Add them to your _My Healthy Environment_ paper now.

6. Examine your _My Healthy Environment_ paper. What could you do to care for and keep that environment healthy? Caring for the environment is called **stewardship**.

7. Turn to a partner and discuss:

   a. What responsibility do you think you have toward your environment?

   b. What kinds of actions could be part of stewardship of your environment?

8. Read the quote from Dr. Nicole Redvers. Throughout this guide you will notice boxes like this. Each box has ideas from a person working for environmental justice. These ideas can help you understand new perspectives.

Ideas about our roles as stewards and caretakers of the Earth have been around for thousands of years. We have a relationship to ourselves and other human beings on the planet, but also to all of the other organisms and elements that exist. This relationship is part of us, not an outside responsibility that is learned. We are of nature, not with nature or in nature—we are nature. We're supposed to be stewards of this Earth. Not to control, but to be part of the process and complexity of the Earth. And to understand her in a way that allows us to thrive, but also to allow Mother Earth and also all of the other organisms to thrive as well.

—Dr. Nicole Redvers

Dr. Nicole Redvers is an assistant professor at the University of North Dakota and co-founder of the Arctic Indigenous Wellness Foundation. She is driven by the need to elevate and amplify global **Indigenous** voices in the area of Indigenous and planetary health. Indigenous means a group of people or other living things that are native to a place and have not migrated from elsewhere.

9. Pull out your _Identity Map_. What things about your identity might make you more interested in being a steward of your environment?

a. If you knew you and your family would be living in a place for many generations, would that make a difference?

b. If you knew that your actions were part of a **collective effort**, would that make a difference? A collective effort is an action that many people take by working together.

c. What else do you think makes people want to be stewards of their environment?

10. Think quietly to yourself about the type of relationship you would like to have with your environment. Are there words or images that come to your mind? Consider:

a. How do you want to positively affect your environment?

b. How do you want your environment to positively affect you?

11. On your _My Healthy Environment_ sheet write or draw something to help you remember the relationship you would like to have with your environment.

12. Read _Taking Care of Yourself_.

Taking Care of Yourself

In this guide you will be learning more about some challenging ideas. You may sometimes find yourself sad or overwhelmed. These feelings are okay. You are part of many people around the world working to think about ways to make our shared world and future better.

If you find the topics too challenging, you can always:

a. Take a break for a few minutes.

b. Breathe slowly and deeply in and out 10 times. Repeat as often as you need to.

c. Use your senses to practice noticing where you are right now, as you did at the beginning of the _Notice, Think, Wonder_ activity. This can sometimes feel calming.

d. Imagine you are in the environment you recorded in _My Healthy Environment_. Consider what you would be hearing, tasting, smelling, feeling, or seeing.

e. Talk to a trusted person or connect with another living thing, like a pet.

f. Use another method that you know helps you feel calm or connected.

13. Think about which _Taking Care of Yourself_ methods will work best for you. Test out different methods and find the one or ones you like.

14. Plan to use this best method or methods to take care of yourself if the topics discussed in the guide become too challenging.

It can be really **transformative** and powerful to resist the **despairing** feeling that environmental collapse is **inevitable**. Right now you have the capability to **defy** the system. We have the capability to gather to improve the system, and we're not alone.

We're not hopeless, either. We're just angry and we're sad because the most enraging and the most saddening thing is happening to the world. Confronting that and having that important emotional reaction is an important part of taking action. When we are angry that is how we know we have hope, because you wouldn't be angry about something that you don't think that you can change.

It's very important to remind ourselves that there is time for emotions and emotions are a form of work. Emotions can be **radical** as well. They can be a way of resisting this idea that we always have to produce, that we always have to fight. Allowing ourselves and our communities space and time to heal is a form of activism in itself.

—Topaz Zega

Topaz Zega (they/he) is a non-binary climate justice activist working in Mexico and Singapore. Their involvement in climate groups began when they were affected by earthquake disaster and witnessed their community being harmed by the social inequities perpetuated during the COVID-19 pandemic.

Task 2: What is environmental justice?

What does **environmental justice** mean? Different people may have different ideas. In this task you will decide with your team what environmental justice means to you. You will *discover* your own ideas about justice and how that intersects with different environments. Then you will investigate to *understand* more about your interactions with your environment. Finally, you will *act* to create a definition of environmental justice for you and your team.

Discover: *What is justice?*

Before you think about the meaning of environmental justice, you need to start by thinking about what justice itself means. Different people may have different opinions about whether or not a situation is just. Thinking about justice as a group helps you consider new perspectives.

1. Have a team member write the word "Justice" on the board, a large piece of paper, or in a shared digital document. As a team or class, you are going to be thinking about the meaning of justice.

2. Each person in your group should add to, refine, and question the team meaning of justice.

   a. Add: Try to think of different parts of the meaning of justice. Each person should add one new word to the meaning. Do not add anything someone else has already added. You could add a word related to what justice means to you; or what you think justice feels like; or another word that helps you understand justice.

   b. Refine: Consider the words your group has written. How can you make those ideas clearer? Each person should refine one idea. Draw lines off the words to help you refine your meaning. For example, you could draw a line connecting a word with an example or a comment. Or you could draw a line between two words to show a connection between them.

   c. Question: What else do you need to know or think about as you consider the meaning of justice? Write down any questions you have on the edges of the board or paper.

3. Examine your ideas about justice with your team. If there are any ideas you notice that are missing, add them now. If there are questions you can answer, refine your meaning with those answers now.

4. As a team, mark the words or ideas on the board or paper that you think must be part of a definition of justice.

5. Together, use these important ideas to develop a group definition of justice.

6. Title a sheet of paper "Justice Reflection." Write your group's definition of justice at the top of the page. Keep this page safe. You will be adding to it during the other tasks in this guide.

7. Now, draw a line on a class board or on a sheet of paper, as in Figure 4, and label one end of the line "Just" and the other "Unjust." Or imagine a line running across your classroom, and choose one side of the room to be "Just" and the other "Unjust."

Unjust   **Just**

Figure 4: Unjust to Just line.

8. With your teammates, examine at least three of the statements below. If you have time, think about more of the situations. How just or unjust do you think each of these situations are? For each situation, write the situation letter or physically place yourself along the line between "Unjust" and "Just." For each statement, a few teammates with different perspectives should share what they thought made the situation just or unjust.

   a. One country sends many old or broken computers, phones, and other electronics to another country. Although the other country is paid to take the waste, it exposes their people to toxic materials.

   b. Plastic pollution breaks into smaller and smaller pieces in the ocean. This is called **microplastic**. Each year more plastic pollution means more microplastics in the environment that hurt people and other living things.

   c. A large online retailer is building many new warehouses. Vehicles go to and from these warehouses frequently, polluting the surrounding air. Studies show

these warehouses are more likely to be built in neighborhoods where many people of color (people who are not white) live.

d. A court rules that an Indigenous group has the right to freely access their traditional lands, even though those lands cross an international border. Other people have to stop at the border and show their passport.

e. One country's land is disappearing as the sea level rises due to climate change.

f. Employers require farmworkers work outside as a wildfire approaches, exposing them to thick smoke.

g. A town has struggled with lead poisoning among low-income families living in older homes. Community workers now visit these families to do free testing for home hazards, like lead-based paint. Families receive resources and information to help them stay safe from these hazards.

h. A group of people has been gathering and eating plants from the marshes around their home for hundreds of years. Gathering and eating these plants is an important part of their culture. Recently other people have drained the water from the marshes and used the water for other purposes. The plants can no longer grow in the drained marshes.

i. In one region a new law requires a special review of the environmental and public health impacts when building things such as sewage treatment plants, landfills, and power plants in communities that have large low-income or minority populations.

j. A changing global climate means that people and other living things in the future may have much more extreme heat than today.

k. A country has granted its waterways the same legal status and protections as humans. Anyone harming the waterways can be taken to court and charged as if they had harmed a human.

> ### ⚠️ Emotional Safety Tip
>
> There are no wrong or right answers. Different people can have different perspectives. Considering different perspectives helps the group think better together. It may feel difficult to disagree with someone or have them disagree with you. Remember, disagree with ideas, not with people. For example, you could say, "I disagree with that idea because . . ."

9. Examine the situations you considered. Share your thoughts with your team for each situation.

    a. If you felt a situation was unjust, who were the people or other living things you felt were treated unjustly?

    b. Remember back to the categories on your _Identity Map_. Are there identities you can think of related to people being treated unjustly? For example, maybe only people living in a certain place or young people are treated unjustly in a situation.

10. Take out your _Justice Reflection_ sheet. You will be using this during other tasks in this guide to help you remember your ideas about justice and **injustice**. Injustices are situations that are not just. You can record your ideas using words or drawings.

> ⚠️ **Emotional Safety Tip**
>
> Sometimes different parts of identity, like your race, gender, sexuality, or family's income level may be linked with how likely you are to experience injustices. Your experience or inexperience with injustice is not your fault. You can help to solve these problems, but you are not to blame for them.

11. Discuss with your team and record your answers on your _Justice Reflection_ sheet:

    a. Who did you feel was treated unjustly in the situations you considered?

    b. Are there identities you can think of that are sometimes related to experiencing injustices?

    c. Do you think some people are more aware of those links than others?

12. Read _Different Perspectives_.

Different Perspectives

People may have different perspectives. Often a person's perspective may be related to parts of their own identity or experiences.

Considering different perspectives can help uncover sustainable solutions. **Sustainable** means balancing the needs of different people and other living things over the long term. When thinking about sustainability, it is important to consider four types of perspectives: social, economic, environmental, and ethical.

- **Social** is about the interaction of people in a community. The health, education, and well-being of people are the most important thing from this perspective.
- **Economic** is about money, income, and use of wealth. Economic growth, including making sure people have jobs and enough money, is the most important thing from this perspective.
- **Environmental** is about the natural world. Protecting the Earth and its natural systems is the most important thing from this perspective.
- **Ethical** means the fairness of something. Doing what is right and having a just community where everyone is treated fairly is the most important thing from this perspective.

13. Return to step 8 and examine at least three situations. Split your team into four groups. Assign each group one perspective: social, economic, environmental, or ethical.

14. Discuss with your group whether the situation or situations are just or unjust from your assigned perspective. Share your ideas with the rest of your team.

15. Discuss as a whole team:

    a. Do any situations feel unjust from one perspective but not another? For example, maybe a business pays its workers well but releases a lot of air pollution. That situation might be just from an economic perspective, because the business creates good-paying jobs. However, it might be unjust from an environmental perspective because the business may be polluting the environment.

    b. Why is it important to consider different perspectives?

    c. Whose perspectives do you think would be most important to consider when making decisions?

16. Have each team member pick one situation and share what, if anything, they would change about the situation to make it just.

Understand: *What is the relationship between people and the environment?*

People affect and are affected by the environment. A healthy environment can help us become healthier and happier. Healthy environments are places that are good for living, working, and playing. Unhealthy environments make it hard to live, work, and play. People play a part in the environments around them. They can make human-created environments that help or hurt people and other living things. They can protect or harm natural environments.

1. Read *The Effect of the Environment on People*.

The Effect of the Environment on People

Every day people around the world are affected by their environment in lots of different ways. Some ways are good and help keep you healthy and happy. Some ways are bad and may harm your physical or mental health. The effect of the environment on you includes:

- Things in the environment enter your body through food, water, air, or things on your skin like soaps or lotions.
- You may be exposed to things in an indoor environment such as toxic substances like smoke, lead, or mold.
- You may experience environmental situations that scare you or upset you, such as a hurricane or wildfire, or ones that awe you like a beautiful sunset or an amazing view.
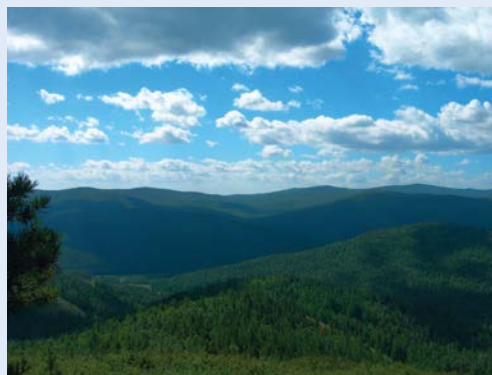

Figure 5: A beautiful mountain view.

- Conditions outside such as temperature, weather, and noise might affect you in positive or negative ways.
- Your environment might provide opportunities such as exercise, recreation, or a sense of peace or connection.

2. Discuss with a partner some of the things you do almost every day. For example, maybe you brush your teeth or walk to school or eat lunch.

3. Work with a partner to discuss good and bad ways you are affected by your environment during your daily activities. For example, maybe you walk to school each morning. If it is a quiet, peaceful walk the environment may help you to feel calm and happy. If it is a noisy walk with lots of traffic, the environment may make you feel stressed because of the noise or make it hard to breathe because of the fumes from the traffic.

4. Think quietly to yourself for a moment about how your environment is part of keeping you healthy and happy. Remember what you noticed in Task 1 about your indoor and outdoor surroundings.

5. Take out a beanbag, a soft ball, or another soft item that can be easily tossed. Have one teammate start by sharing an idea of one way the environment can help keep you happy and healthy. After the team member has shared their idea, they should toss the soft item to another team member to share a different idea. Keep tossing the item until all team members have shared.

People sometimes think of the environment as something separate from them that could be toxic or hazardous. This leads to people talking about the environment as a source of problems, instead of the foundation for life, health, and well-being. Instead of environment as a source of hazards, we should think about the environment as our shared home that we are all part of: creating a sense of shared responsibility, connection and care, rather than disconnection, isolation, and fear.

—Dr. Margot Parkes

Dr. Margot Parkes is a doctor from Aotearoa/New Zealand who now works as a professor in northern British Columbia in Canada. She is inspired by connecting with others to demonstrate shared respect for land, air, and water as living systems, and as foundations for health, equity, and well-being.

6. Now think quietly to yourself for a moment about how your environment might make it harder to be healthy and happy.

7. Toss the soft item between teammates again and have everyone share their ideas about how the environment might be harmful to your physical and mental health.

8. Read _The Effect of People on the Natural Environment_.

The Effect of the People on the Natural Environment

People have changed local and global environments in big and small ways. These ways include:

- Changing the natural water systems of the Earth through pollution, water use, and changing the way water flows, such as by using dams.
- Changing what is in the air on Earth by burning fossil fuels.
- Making changes to land to meet human needs for agriculture, housing, business, resources, and transportation.

Figure 6: Construction vehicles changing the land.

Task 2

- Extracting resources through drilling and mining.
- Releasing human-made chemical and other waste products into the water, air, and soil.
- Disrupting natural **ecosystems** and other living things. Ecosystems are communities made of living things and nonliving things.
- Making human-created environments such as buildings, highways, and airports.

Some changes may hurt the natural environment more than others. The choices made by people, governments, and organizations can decide whether the natural environment is protected or harmed.

9. Consider the different changes listed in _The Effect of People on the Natural Environment_. Think quietly to yourself about what you have noticed about ways people, including individuals, businesses, and governments, harm the natural environment.

10. Toss the soft item between teammates again and have everyone share their ideas about how people might harm the natural environment.

11. Think quietly to yourself about stewardship and the natural environment. Remember your ideas from Task 1. What are some ways people can protect the natural environment?

12. Toss the soft item between teammates again and have everyone share their ideas about how you might protect the natural environment.

We create built environments, but we don't create the ecosystems or living systems that we depend on. So how can we create environments that are healthy and not harmful to the living systems we depend on? The harms to these living systems are the harms that are the most detrimental for our shared future. How can we work together to create built environments that are healthy and not harmful for everyone, including other species?

—Dr. Margot Parkes

13. **Justice Reflection:** Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

   a. Think of an example of an unhealthy environment, such as a community with a lot of air pollution coming from a highway. Consider:

   - Who is making choices that harm the environment, and why? For example, the drivers, who can now go places more quickly.

   - Who is hurt by the unhealthy environment? For example, the people living around the highway who are breathing in a lot of pollution.

   - In your example, are the people making the harmful choices and the people who are hurt by the unhealthy environment the same group? Sometimes one group of people creates an unhealthy environment, but another group has to live in the unhealthy environment.

   - How often do you think this happens? Is it unjust or just?

   b. Is it important to consider how environments might harm or help living things other than humans? If so, why?

Act: *How will I define environmental justice?*

This guide is about environmental justice. You have thought about the environment and how it affects you and others. You have thought about justice. How do those two ideas **intersect** or overlap?

1. As a class or with your team, draw on the board or a large sheet of paper two large overlapping circles like those show in Figure 7. Write the word "Environment" in one circle and the word "Justice" in the other.
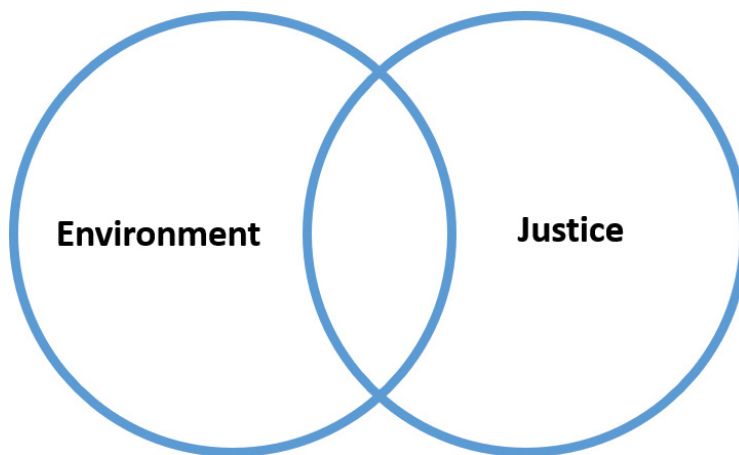
Figure 7: Environmental justice diagram.

2. In the *Environment* circle, write or draw ideas about the meaning of the environment and the different parts of the environment.

3. In the *Justice* circle, write or draw ideas about the meaning of justice from your *Justice Reflection* sheet.

4. Discuss with your teammates how the concepts of the environment and justice intersect. For example:

   a. What would it mean for an environment be just or unjust?

   b. What would a just environment include?

   c. What would a just environment not include?

   d. Who or what is affected by a just or unjust environment?

5. By yourself, think, write, or draw your ideas about what environmental justice means.

> From an Indigenous perspective, the idea of environmental justice is about reimagining and reinvigorating our traditions of sustainability and having the power to do that; to both physically and culturally interact with the environment and to have a voice in government and making decisions about the environment.
>
> —Gabbi Lee
>
> Gabbi Lee is a Cultural Interpreter at the Smithsonian's National Museum of the American Indian in Washington, DC. As a Kanaka Maoli (Native Hawaiian) educator, her work aims to bring authentic Indigenous perspectives to learning about Native peoples and cultures.

Task 2

6. Share your thoughts with your teammates and pay attention as they share their thoughts with you.

7. As a team, build a group **consensus** of your team's definition of environmental justice. A consensus is a balanced decision that works for everyone in the group.

  a. Start by finding words or ideas that are part of many team members' definitions, and record these thoughts.

  b. Next, pay attention to ideas that are in only one or two definitions. Have the people who came up with those ideas share why they think they are important. Discuss as a group. Does everyone agree that these ideas should be part of your definition? If so, add them.

  c. Read your definition. Is there anything missing? Make sure everyone on your team is comfortable with your definition.

  d. Write down your environmental justice definition on your *Justice Reflection* sheet.

8. As a team, consider how you could communicate these ideas with others. One way to take action is by communicating with others. Some people may not be familiar with the idea of environmental justice. How could you help explain it to them in a way they will understand it and remember it?

9. Read *Communication Strategies*. Pick some of the strategies you think you might like to use when communicating about environmental justice with others.

Communication Strategies

There are many ways to communicate with others. Which ones will work best depends on the information you are trying to share, the way people around you are used to getting information, and your own preferences. Here are a few communication strategies to consider.

Writing

Writing can take many forms: essays, pamphlets, news reports, fictional stories, poetry, social media posts, and many others. Some people feel most comfortable giving and receiving information in written form.

Storytelling

Sharing stories can be an important way to communicate ideas. Stories are sometimes shared through public speaking, recorded in a podcast or video, or presented dramatically on stage. Some people prefer to use stories to give or receive information.

Visual and Performance Art

There are many different art forms that can be used to share information and encourage others to consider new perspectives. Visual arts like painting, drawing, sculpture, printmaking, textiles, and photography, and performance arts like dance or music can be powerful ways of communicating. Some people feel most comfortable giving and receiving information shared through an artistic medium.

Digital Tools

Different forms of digital communication, such as memes, gifs, short videos, and other methods can be used to share information. Often these communications are posted on social media sites and can be shared easily with others. Some people prefer to use social media or other digital spaces to give and receive information.

Another method

There may be another way you use to communicate with others, or you might combine some of the ways already listed. Think about how you get information and ways you could share something important with others.

10. Decide on a way of communicating the meaning of environmental justice. Create and share your communication with another team, your friends, family, or other group.

Task 3: How does the environment affect health and well-being?

You started to think about how the environment around you affects you and others. Now you will consider the influence of the environment on your health and well-being. In this task, you will **discover** how different environments can make people more or less healthy. Then you will use data to **understand** the health conditions faced by different communities. Finally, you will **act** to share information about health problems in your community.

Discover: *What makes an environment healthy?*

Physical and mental health are affected by the environment in many ways. In the *My Healthy Environment* sheet from Task 1 you described an environment that helps people to be healthy and happy. Other environments may harm people and make it difficult for them to be healthy and happy.

1. Work with your team to draw three columns on a board, large piece of paper, or a shared digital space. Label the columns "Healthy Environment," "Unhealthy Environment," and "Health Conditions"—there's an example in Figure 8.

Healthy Environment	Unhealthy Environment	Health Conditions

Figure 8: A Healthy and Unhealthy Environment chart.

2. Examine the ideas on your *My Healthy Environment* sheet. Add those ideas and any others you have about what a healthy environment should be like in the *Healthy Environment* column. Be sure to include some ways the environment could help people, as you learned in Task 2.

3. Consider your *Healthy Environment* list. How could this type of environment make people healthier and happier? For example, would having access to a healthy environment allow people to exercise more or make them less anxious? Write or draw those ideas under your list.

4. Add ideas about ways the environment might be unhealthy for people in the *Unhealthy Environment* column. Be sure to include some ways the environment could harm people, as you learned in Task 2.

> Air pollution, rising temperatures, natural disasters, biodiversity loss—the environment and environmental factors influence pretty much every health problem that there is out there.
>
> —Dr. Sadhbh Lee
>
> Dr. Sadhbh Lee is a doctor from Ireland and a founding member of the organization Irish Doctors for the Environment. Her motivation comes from a great love of nature, especially the ocean, and a desire to protect the health of both her patients and the planet.

5. Consider the *Unhealthy Environment* column. With your team, can you think of any health conditions that might be caused by or made worse by an unhealthy environment? Write or draw your answers in the *Health Conditions* column. You might want to remember any health conditions you, your family, your friends, or others you know may have had.

> ⚠️ **Emotional Safety Tip**
>
> People often want to keep their health information private. Use your experiences to help you think of different ideas, but do not share specific health information about people you know with your team.

Be sure to include diseases or health conditions that:
   a. Last a short time, such as a headache.
   b. Last a long time, such as diabetes.
   c. May be triggered by **exposure** to something, such as allergic reactions. Exposure is when you come into contact with something, for example by breathing or eating something.

d. Affect mental health, such as depression.

e. May be caused by exposure to toxic substances such as lead, mercury, benzene, asbestos, or arsenic.

f. May not be common in all places, such as malaria.

g. May not be common among all age groups, such as strokes.

h. Only affect people during a specific time in their lives, such as when they are children or pregnant.

People who live in highly polluted areas are more likely to become ill with many diseases. Climate change is actually leading to faster transmission of many infections.

—Dr. Parmdeep Singh

Dr. Parmdeep Singh is a doctor and is working as an additional professor of radiology at All India Institute of Medical Sciences in Bathinda, India.

6. Examine the *Health Conditions* column. Do you notice any common causes of health conditions? For example, maybe polluted water might cause or worsen several health conditions. Circle or make another record of these common ways environments hurt people's health and well-being.

7. Read *The Sustainable Development Goals*.

The Sustainable Development Goals

Thinking about the connection between local and global environments is an important part of being an action researcher. In 2015, countries around the world agreed on the most important global problems to work on solving over the next 15 years. Using an international organization that represents almost all the countries in the world, the **United Nations**, they set goals to help them think about the better world they would like to live in. These goals are called the **Sustainable Development Goals**. Many of the Sustainable Development Goals are about problems with the environment or health. People around the world are working toward these goals.

8. Examine your *Unhealthy Environment* and *Health Conditions* columns. Do any of the Sustainable Development Goals shown in Figure 9 relate to the environmental or health problems on your list? If so, write the Sustainable Development Goal number or numbers next to each idea on the list.

Figure 9: Sustainable Development Goals.

14. **Justice Reflection:** Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

    a. Are there parts of an unhealthy environment that are not addressed in the Sustainable Development Goals? If so, how do you think that will affect the communities who face that type of environment?

    b. There are healthy and unhealthy environments. Do you some places around the world have more unhealthy environments that others? If so, why?

Understand: *How do health risks relate to environmental issues?*

You have thought about how the environment can affect people's health. People in different areas may face different health risks. Scientists and other researchers learn more about problems by gathering **data**, or pieces of factual information. They use these data to develop **health statistics**. Health statistics are numbers used to understand how healthy a group of people are. What can these health statistics tell you about the environment of a place? In this activity you will investigate to find out more about the health and health statistics of your local area.

1. Think about what you would need to understand the overall health of people in your community. Discuss with your team:
   a. What types of information could be gathered that could tell you about the health of people in your community?
   b. Can you think of any ways to measure whether the people in your community are healthy?
2. Read *Understanding Health Statistics*.

Understanding Health Statistics

The overall health of a group of people can be measured in different ways. One way is to measure the length of people's lives. For example, you could measure **life expectancy**, or the average of how long people live. Or you could find out more details by examining the causes of death.

> ⚠️ **Emotional Safety Tip**
>
> It can be difficult to think about death, especially if you have lost a loved one. It is okay to feel sad or upset. If you need to take a break, try using one of the ideas from Taking Care of Yourself in Task 1.

You also can use statistics to examine changes in health over time. For example, in 2020, the average length of a person's life globally was 73 years. In 1950, a person lived an average of 46 years.
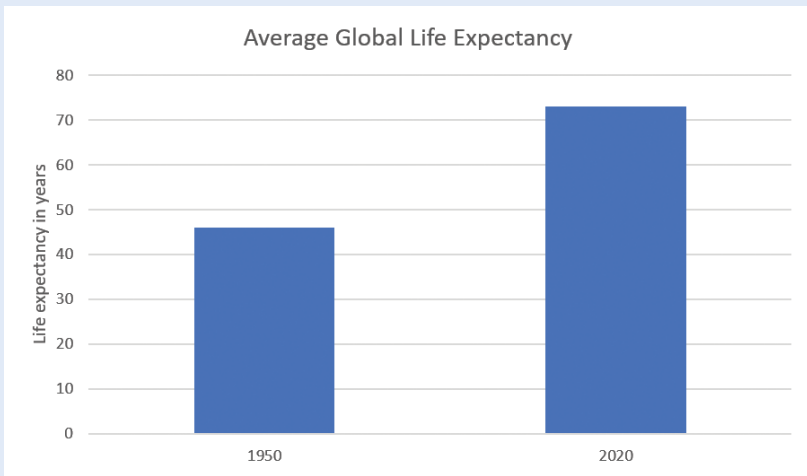
Average Global Life Expectancy

Figure 10: Average global life expectancy in 1950 and 2020[1].

You can also compare statistics from different places to help you understand the health of people in different locations. For example, in 2019 in Japan life expectancy was 84 years and in Afghanistan it was 63 years.

Average Life Expectancy by Country in 2019
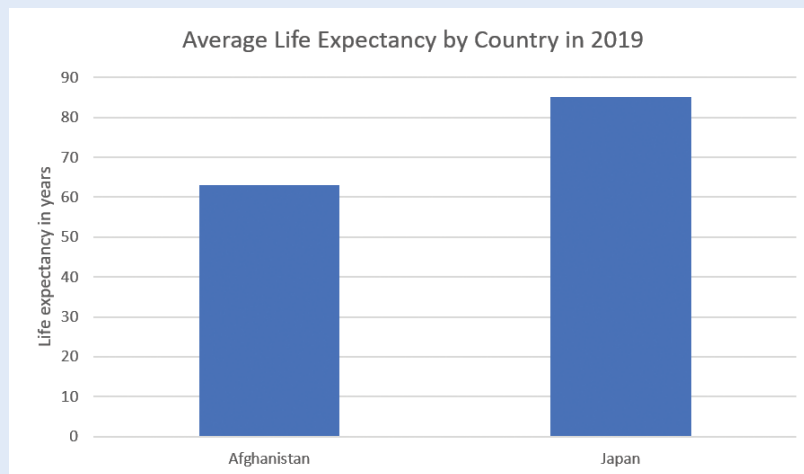
Figure 11: Average life expectancy in Afghanistan and Japan in 2019[2].

Health statistics can also be used to examine health problems while people are living. Even if people are alive, it is a problem for them and their community when they are unable to work, learn, and play because they are not healthy. One measure of people's health is **Disability-Adjusted Life Years**, or DALYs. Each DALY measures the loss of one year at full health for a person. For example, if a person had a health condition that made them very sick for a year, that would count as one DALY. Or if someone had a health condition that made them die 20 years earlier than they normally would have, that would count as 20 DALYs—one DALY for each year they "missed." By examining the causes of DALYs you can understand the major reasons for poor health and death in a place.

3. Examine Figure 12. It shows the top causes of DALYs in two countries. One is Burundi, which globally has one of the lowest incomes per person. The other is Luxembourg, which globally has one of the highest incomes per person. In parentheses you can see the rate of DALYs for 100,000 people in each country. Discuss with your team:

   a. What do you notice about the differences between the two places?

   b. What do you think might be causing the differences in statistics?

- Think about the causes of the different diseases listed. Do you think any of them are related to unhealthy environments? For example, are there any diseases or health conditions that might be related to access to clean water, clean air, food, health care, or safety?
- Health statistics can provide clues about what is happening in the environment of a place. How do you think the environments of Burundi and Luxembourg might be different?

c. What do you wonder about health statistics from your own community? Make some predictions with your team about what you think the DALYs would be in your local area.

Burundi (DALY rate per 100,000 people)

1. Neonatal conditions (6943)
2. Lower respiratory infections (4311)
3. Diarrhoeal diseases (3494)
4. Malaria (3493)
5. Road injury (2231)
6. Protein-energy malnutrition (1644)
7. Congenital anomalies (1499)
8. Tuberculosis (1311)
9. Collective violence and legal intervention (1183)
10. Stroke (1093)

Luxembourg (DALY rate per 100,000 people)

1. Ischaemic heart disease (1573)
2. Back and neck pain (999)
3. Trachea, bronchus, lung cancers (928)
4. Diabetes mellitus (904)
5. Chronic obstructive pulmonary disease (865)
6. Falls (819)
7. Stroke (681)
8. Alzheimer disease and other dementias (661)
9. Depressive disorders (630)
10. Gynecological diseases (590)

Figure 12: Comparison of top 10 DALY causes in Burundi and Luxembourg[3].

4. **Justice Reflection:** Discuss this question with your team. If you have ideas you want to remember, record them on your _Justice Reflection_ sheet.

a. Do you think the differences in health statistics between the different countries show any environmental justice issues? Why or why not?

5. Now you will find out more about health statistics in your own local area or country. Use a piece of paper, a digital document, or another method to create a

way to record the health statistics you find for your area. With your team, decide what information you want to find out about health in your local area or country. For example:

    a. Are you interested in how long people live? Write down "Life Expectancy" as a category.

    b. Are you interested in why people die? Write down "Causes of Death" as a category.

    c. Are you interested in the causes of poor health? Write down "Top DALYs" as a category.

    d. Is there other information you would like to find out? Write down a category to describe it.

> ⚠️ **Emotional Safety Tip**
>
> If you notice that your country or place does not have very good health statistics, it can make you feel angry or sad. These feelings are okay. Your local health situation is not your fault, but you can help to make it better. In this guide you will think about actions you can take to help make your local and global environments healthier.

6. Plan and carry out your investigation after reading *Health Statistics Investigation*.

Health Statistics Investigation

You can find out more about health statistics from your area. This can help you understand more about the health and the environment of your local area.

Finding Statistics

If you have access to the Internet, there are many websites that can help you find more about health in your community. If you go to the *Environmental Justice! StoryMap* you will find several websites listed there to help you get started. You also might be able to find other places online to search, such as government websites or other sites that share information about health statistics in your local area.

You could also contact people who know about health in your area. Many places have experts working in public health or medical professionals who could share information with you.

With your team, decide how you will find information.

Deciding on an Area

Finding out information for your country may be quite easy. It may be harder to find information about your city or town. Try to find information that is as specific to you and where you live as possible.

With your team, decide if you will investigate your country or local area.

Comparing to Others

Sometimes it is helpful to examine health statistics from other places to help you figure out what is unusual about health where you live. You may want to compare the health statistics you find about your community with global health statistics. You may also want to compare them with somewhere more specific. For example, maybe a nearby neighborhood, city, town, or country that you guess might have different health statistics than yours.

You also might want to compare the health statistics of your area now with a time in the past. If the health statistics have changed a lot, it may be a sign that something else in your environment is changing as well. These changes may be good or bad.

With your team, decide what you will compare.

Understanding Health Statistics

Health statistics can come in different forms. Try to find statistics that match the chart you want to fill in. Make sure you pay attention to whether the statistics are about deaths, DALYs, or another measure. There may be a lot of statistics available, but don't be overwhelmed. Just pay attention to the most important statistics. For example, if you are searching for causes of deaths, maybe you only need to list the top causes, not all of them.

With your team, use the statistics you find to fill in your chart.

7. Examine the statistics you gathered. With your group, discuss:

   a. Were there statistics that surprised you?

   b. Are there ways you would like to change the health statistics in your community?

   c. How did your community compare to others? How did that make you feel?

🌊 ☁️ 🌱 ☀️ 💧 🌲 ⚡ 🌊 ☁️ 🌱 ☀️ 💧 🌲 ⚡ 🌊 ☁️

Act: *How can people work together to create a healthier environment?*

Some environmental and health problems are local to one place and some are global. Environmental and health issues can have a big impact on a community. People can work together locally and globally to make their environment healthier. Action researchers can research a problem and help a community find ways to act to make it better.

1. Think back to the diseases and health conditions you learned more about in the Discover and Understand activities of this task. Discuss with your team:

   a. Which health conditions are a major problem in your area?

   b. Are there things in your local environment that might be making these health conditions worse?

   c. How could things be better?

> Health is shaped. It is a product of an entire process, and the different things at play in that process include your environment, education, access to health care, and housing. These things that contribute to health are the social determinants of health. The reason they are social is they're not genetic. Which house you live in, what's being spewed into your air, that has nothing to do with your genes. These things are not biological in nature, they're socially determined.
>
> —Dr. Onyemaechi Nweke

Dr. Onyemaechi Nweke is the science advisor for the Office of Environmental Justice at the US Environmental Protection Agency in Washington DC. She is motivated by the enormity of the change that is possible with public **policy**. She is passionate about educating youth regarding their roles in shaping government decisions so they can create environments and experiences that enable them to thrive.

2. **Justice Reflection:** Are there things you noticed about your local area in this task that seem unjust? Discuss with your team and record your ideas on your *Justice Reflection* sheet.

3. Read *Collective Action*.

Collective Action

Environmental and health problems can be complex. This does not mean they cannot be solved, but it does mean it is easier to solve them if many people work together.

Imagine a piece of furniture or something heavy that would be impossible for you to lift by yourself. Would you try to lift it alone or would you ask others to help you? Many people working together can do things that would be impossible alone. Creating change in your community sometimes takes a lot of people, but you are a very important part of the group.

---

4. With your team, make a list on a board or just discuss:

   a. Local groups you know that are working to make your community a healthy place to live. If you can't think of any, ask other people in your community, or if you have Internet access try searching online.

   b. National groups that are working to make your country a healthy place to live. If you don't know any, you can try searching online.

   c. Global groups that are working to make places around the world healthy places to live. If you don't know any, you can try searching online.

> Those new to environmental justice should know that they are not the first group to tackle this problem. There are people out there already involved who have been fighting the environmental justice battle for decades.
>
> —Christopher Williams, PhD
>
> Christopher Williams, PhD, is the STEM Education Specialist at the National Museum of African American History and Culture. He is passionate about combining STEM and history to improve the lives of others.

5. Think about the connections between collective action at a local level and collective action at a global level. Discuss with your team:

    a. Do certain health or environmental problems need global collective action to solve?

    b. If so, what are some examples of problems like this?

    c. Why do you think global collective action is important?

6. Pick the Sustainable Development Goal you think is most closely related to a health problem you know about in your community. You can review them in Figure 13.

Figure 13: Sustainable Development Goals

7. Design a way to share with other people in your community why you think this is important. Remember the *Communication Strategies* from the Act activity in Task 2. You could consider creating:

    a. An infographic using the health statistics you collected.

    b. A drawing of a future where that Sustainable Development Goal was met.

    c. A story about someone with this problem.

    d. A podcast interviewing an expert.

    e. Another communication method.

8. Put your communication strategy into action and share information about health problems in your community with others in your class, school, or larger community.

Task 3

Task 4: What environmental problems is my community experiencing and why?

As action researchers, one important job is to identify problems in your community. In this task, you will **discover** the history of your local environment. Then you will investigate and collect data to **understand** more about problems in your local environment. Finally, you will use the data and stories you collected to **act** and communicate about the environmental issues in your community.

Discover: *What has happened and is happening in my local environment?*

Environmental problems can be different for every community and can affect people in different ways. As an action researcher, before you try to solve problems in your community, you first need to find out what the problems are and why they exist. One of the most important ways to find out more about environmental problems in a place is to ask the people living there what they have experienced. In this activity, you will research the environmental issues found in your own community and the people they affect.

1. With your team, create a shared digital document, write on the board, or use a large piece of paper to make a table. Title it "Environmental Problems." Divide your table into three columns and label them "Problem," "Research," and "Impact." Figure 14 shows an example.

Environmental Problems		
Problem	**Research**	**Impact**

Figure 14: Example of an <u>Environmental Problems</u> table.

2. Start with what you already know. You are an important member of your local community. Are there environmental problems you have noticed in your community? If so, list them under *Problem*. Be sure to consider questions such as:

   a. Is your community loud? Do you have trouble sleeping at night or focusing on homework?

b. Is it easy for you to access water that is safe to drink?

c. Is the air healthy to breathe?

d. Is it easy to get healthy food?

e. Are there natural areas you can visit to help you feel peaceful?

f. Do you feel safe in your community?

g. Is there anything in the soil that makes it unsafe to eat plants that grow there?

h. Are there problems with trash or waste in your community?

i. Are there natural disasters, like hurricanes, typhoons, tornadoes, cyclones, droughts, flooding, or wildfires?

j. Are there any issues with bodies of water like a lake, river, or ocean?

k. Does it get so hot that it is difficult to stay comfortable or safe?

l. Are there safe places to walk or cycle?

m. Are there other environmental issues you noticed while you were doing Tasks 1, 2, and 3?

There are a lot of different regional issues when it comes to environmental justice. What we're experiencing in New York is completely different than what they're experiencing in Savannah.

—Taylor Morton

Taylor Morton is the Director of Environmental Health and Education at WE ACT for Environmental Justice. Taylor also recognizes the importance of exposing **BIPOC** and low-income youth to natural elements, and actively supports this mission. BIPOC means for Black, Indigenous, People of Color.

3. Include problems you know about that are already getting better. Sometimes areas had environmental problems in the past that people have already worked together to solve, just as you will be working to solve the problems that still exist. Listing the problems that have already been solved can help you remember that positive change is possible.

4. For each environmental problem, put your experience with that problem under *Research*. For example, if you listed frequent flooding as a problem, you could put some details of flooding you have experienced, such as when and where it was.

5. For each environmental problem, write what you know about the effects under *Impact*. Include:

    a. Who it affected. For example, you may know that flooding affected your family and the rest of your neighborhood.

    b. What the impact was. For example, the flooding may have damaged people's homes or forced them to evacuate.

6. Examine all the things you and your teammates have written in your *Problem*, *Research*, and *Impact* columns. Are there any environmental problems in your community that you didn't know about? Having the perspectives of many people can help you get a better idea of all the environmental problems in your community.

7. Think about how you could get perspectives from outside your class. One way to do this is to ask people about their experiences in your community. You can do this by interviewing other people in your community. When people share the story of their experiences it can be very powerful and contain important data. Read the *Environmental Interview Instructions* for more information.

Environmental Interview Instructions

You can interview people in your community to learn about the environmental experiences they have had. Often this can help you find out the most important environmental problems in your community. Interviewing community members can also help you understand how your community has changed.

Choosing People to Interview

    a. Think about who might know the most about how the environment in your community has changed. For example, it might be people who are part of Indigenous groups, older people who have lived in the community a long time, a local historian, people who work outside, environmental activists, or leaders who make decisions.

b. Every person in your community has a valuable perspective. Remember back to your *Identity Map* from Task 1. Different parts of your identity help give you information. If you can, interview people from a variety of ages, genders, sexualities, jobs, incomes, religions, ethnicities, or other identities so you can get a variety of information. As a team, try to talk to people who live in all parts of your community.

c. Think about the many ways people can share information and try not to leave groups of people out. For example, some people in your community may not use your language. Try to find someone to help you translate so you can find out more about their experiences.

d. Conducting interviews can take a long time, so you may decide to interview to just one person. That is okay. If everyone on your team interviews at least one person, you will have enough information to complete the activity.

Questions

With your team, think about some questions you would like to ask people to help find out about problems in your local area. If you already know some problems, you can ask people about their experiences with that problem. Be sure to also include questions to help you find out about problems you don't already know about. For example:

a. What has changed about the environment of our community while you have been living here? What is better and worse about living here now?
b. Are there environmental problems in our area that we should know about?
c. Are there environmental problems you think will be worse in the future?

Ways to Record an Interview

a. You can interview people many different ways, such as in person, over the phone, using email, or through social media channels.
b. You can use audio or video to record an interview.
c. You can write or draw to make a record of the ideas that are shared with you.

Tips for Conducting an Interview

a. Make sure to ask permission to record a person's answers.

b. Ask permission to share the interview with the rest of your team, class, or other people in the community. People might be more willing to share if their interview is anonymous.

c. If it feels as if someone didn't answer your question, don't be afraid to ask the question again in a different way.

d. Let the person you are interviewing answer the questions in the way they want. Be patient. Listen carefully. Understand that they might give answers you didn't ask for or expect.

Safety Tips for Interviewing People

Ask your teacher for guidelines. They will know what is safest in your community.

⚠ **Physical Safety Tip**

Never conduct an interview alone and always be aware of your surroundings. You might want to suggest recording the interview in a quiet public place.

⚠ **Emotional Safety Tip**

It can be hard to communicate with other people in the community. You may feel shy or nervous. Someone may tell you they don't want to talk. That's okay! It doesn't have anything to do with you. It just means they don't want to share. You can show them respect by thanking them and moving on to another community member.

8. There are also other ways to find out about environmental problems in your community. You can use these in addition to interviews or do them instead. For example, you can:

a. Use online data. Read _Online Environmental Justice Data_ to find out more.

Online Environmental Justice Data

There are many online tools you can use to identity environmental problems in specific places. You may know about a tool just for your country like <u>EJ Screen</u>. EJ Screen shows maps of where environmental justice problems exist around the United States. Or you can use an international data source like <u>EJ Atlas</u>. EJ Atlas shows environmental problems in different communities. Anyone experiencing an environmental issue can contribute to it. You may find an environmental issue in your community that you have never considered before. You can find links to these tools and others on the *<u>Environmental Justice!</u>* <u>StoryMap</u>.

    b. Observe maps of your community from different time periods. Read *<u>Map Observation</u>* to find out more.

Map Observation

Maps are excellent tools to track how a community's environment has changed over time. You can either access maps online, at school, or in your local library. Online maps sometimes allow you to observe the same area in different years or seasons.

Think about different places in your community, like highways, parks, factories, shops with fresh food, airports, and landfills. For each type of place, pay attention to:

  a. Where are these places located in the local area?
  b. Has this changed over time?
  c. How might the changes create environmental issues?
  d. How might the changes help solve environmental issues?

9. Decide on whether you want to conduct interviews, use online data, observe maps, and/or use another method to find out more about environmental problems in your area. Conduct your investigation.

10. Examine the results of your investigation. If you found any new problems, list them under *Problem*, list the information you found out under *Research*, and the people, places, or groups you know were affected under *Impact*. Figure 15 shows an example of a table with one problem listed.

Environmental Problems		
Problem	**Research**	**Impact**
Water pollution is a problem in my community. We can't fish or swim in our local river.	When my neighbor was young, he could swim in the river. He said, "Factories are now dumping waste into the rivers and the water isn't clean like it used to be." I looked at EJ Atlas and found several reports of dangerous chemicals in the river.	Everyone in my community is affected by this issue. But it may especially be a problem for people who rely on the river for fishing and food or people who live near the factories. I think people who do not have the money to move away from neighborhoods near the factories are more affected by pollution.

Figure 15: Example of an <u>Environmental Problems</u> table filled in for one problem.

8. **Justice Reflection:** Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

   a. Are there any groups or locations listed on your *Environmental Problems* table that seem to experience a lot of environmental effects?

   b. Do any of the problems affect other living things, such as animals and plants?

   c. Is there anything else that seems unjust about the problems you identified?

Understand: How can we collect data on environmental issues?

Investigating the environment directly can also provide important information about environmental problems. As action researchers, you can collect data about your local environment. This data will help you understand the problems your community may be

Task 4

facing. This activity includes investigations into different parts of the environment, including noise levels, water and air quality, and extreme heat and weather. You will choose the investigations that are most important for your community.

1. Choose which investigations you will work on. There are investigations about water quality, noise, outdoor air, extreme heat, and extreme weather. Be sure to:

    a. Read through all the investigations listed.

    b. Examine the problems you found out about in the Discover activity. Do any of them relate to the investigations in this activity? If so, you might want to collect data on those problems.

    c. Consider whether there are other things you think might be a problem in your community that you want to investigate.

    d. Think about what you are able to do. For example, can you go to different places or do you have access to the Internet?

    e. Pick investigations that can include everyone on your team. Some investigations may involve moving around or using your senses. If this would be a problem for some members of your team, pick other or additional investigations so everyone can participate.

2. Plan and carry out your investigations. If you discover a new problem, add that to the *Problem* column in your *Environmental Problems* table. If you find out more information about one of the problems, add it to the *Research* column.

Water Quality Investigation

Water is essential for human health. People cannot survive without water. Drinking unclean water can cause many diseases. Sometimes it is easy to tell if water is unclean. Sometimes it can be more difficult. In this investigation you will find out more about water quality.

a. Get out a piece of paper or open a page in your notebook. Title the page "Water Quality Investigation."

b. Make two columns on your paper. In one column write "Cup" at the top. In this column list 1, 2, 3, and 4. In the other column put "Observations" at the top.

c. Get out four clear, colorless cups and fill three of them halfway with water from your water source (tap, well, or whatever you use to drink). Label the cups 1, 2, and 3. Set the fourth cup aside for now.

d. Pick one item from the list next to each cup number. Add the item to its numbered cup. Mix it into the water.

Cup 1: cooking oil, rocks, leaves, or sand

Cup 2: soil or baking soda

Cup 3: salt or vinegar

Figure 16: A setup for the water quality investigation.

e. Carefully observe the water in each cup and record your observations next to appropriate cup number in the *Observations* column.

- What can you see in the cup?
- If you put something with writing behind the cup, is the water clear enough that you can you see the writing easily?
- How does the water smell?
- If you rub your fingers in the water, can you feel anything?

f. Record your ideas to these questions in your *Observations* column.

  - How easy would it be to know whether each cup of water was safe to drink?
  - What clues would you have?

g. Label the unused cup "4." Fill this cup with water from your water source. Observe it closely. Do you notice anything about it that might make you think it would be unsafe to drink? Record your answers on your paper.

h. Optional: Get water samples from other places (like collected rain, other taps, pools, rivers, seas, puddles) and compare them to the water in Cup 4. Record any differences you observe.

i. You can also measure some parts of water quality with a smartphone. If you have access to a smartphone, you can download an app to help you measure particles in a body of water.

An item that makes something like water or soil unclean is called a **pollutant**. Some pollutants, like rocks, sand, oil, and soil, can be easy to notice, as in Cups 1 and 2. Other pollutants in water can be more difficult to notice. Sometimes there can be a smell, as you might have noticed if you added vinegar to Cup 3. Sometimes there might be a taste, as you would have noticed if you added salt or vinegar to Cup 3 and tasted it. Sometimes your senses don't notice anything wrong but there is still a problem with the water quality.

Unclean water can contain pollutants or other things that make it unsafe to drink. These include chemicals like ones used in industry, waste products, bacteria and viruses, runoff from agriculture like fertilizer, or even pollutants from the water pipes, like lead. In many cases, putting these pollutants in your body can lead to illness. Many communities publish testing information that shows whether the tap water is safe to drink. If you have a well, you may have had it tested for water quality. If you want to find out more about water in your community, you could

check with your local government, utility, or other organization that works with water quality to find out if they have published information about your water source.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

- Why is it a problem if water in a community is unsafe to drink?
- Who is most affected if water is unsafe to drink?
- Does water with pollutants affect other living things?
- Would it be unjust if some communities had access to water tests and some did not?

Noise Pollution Investigation

Noise pollution is when the level of noise in a place is harmful or annoying. Loud noises can make it difficult to concentrate or sleep. A noisy place can feel stressful. This can affect your health and well-being. In this investigation you will find out more about noise where you live.

a. Get out a piece of paper or open your notebook. Title the page "Noise Observation."
b. Go to the place where you sleep.
c. Close your eyes and pay attention to your surroundings.

- What are the sounds you hear?
- How do the sounds make you feel?

d. Ask another person to whisper something to you.

- Can you hear them clearly, with some difficulty, or not at all?

e. You can also measure noise levels with a smartphone. **Decibels** measure how loud a sound is. If you have access to a smartphone, download a free decibel meter app and measure the noise level of each place listed in this investigation.

f. Record your observations on your _Noise Observation_ sheet.

g. Go to a place where you study. Repeat steps c, d, e, and f.

h. Go to a place where you go to relax. Repeat steps c, d, e, and f.

i. Go to a busy place in your town. Repeat steps c, d, e, and f.

j. If you are able, repeat the measurements at different times of the day and night.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your _Justice Reflection_ sheet.

- Was it very loud in any of the places you went?
- If so, what does the noise make it harder to do?
- How do you think this affects people or other living things living in loud areas?
- Would it be unjust if some communities had more noise pollution than others?

Outdoor Air Quality Investigation

Earth's air is a mixture of natural gases. It can also include additional gas and particle pollutants. Pollutants are substances that pollute the air, water, or something else. Examples of air pollutants include carbon monoxide, sulfur dioxide, nitrogen oxides, and ozone. Small particles, called **particulate matter**, such as pollen, dust, soot, and smoke are also air pollutants.

Air pollutants mostly come from energy production, industrial processes, vehicles on the highway, and other moving sources such as construction equipment

and aircraft. They also come from wildfires and volcanic eruptions. Particulate matter often forms in the air when other air pollutants, such as sulfur dioxides and nitrogen oxides, have chemical reactions. Air pollutants are linked to many diseases such as asthma, lung cancer, and heart disease.

In this investigation, first you can collect visible particulate matter. Then you will try to observe evidence of particles which may be so small they are invisible.

Particulate matter collection

a. Get out a piece of paper or open your notebook. Title the page "Air Quality Investigation."

b. Choose a wall outside your house or school close to and facing the street. Choose another location inside your home or school.

⚠ **Physical Safety Tip**

Be aware of your surroundings and make sure you stay safe from traffic while doing this investigation.

c. Pick Option 1 or Option 2.

d. Option 1: Take a piece of transparent tape and stick it to the wall, sticky side out. You can use other pieces of tape or another method to attach it to the wall.

e. Option 2: Lightly smear a piece of white unlined paper or small card with something sticky and clear (like petroleum jelly). Stick the paper or card to the outside wall, with the smeared side facing out.

f. Leave your tape or paper/card on the wall for at least six days.

g. Remove the tape or paper and examine it closely. Do you notice anything small stuck to it? If you have a magnifying glass, you may want to use that to look more closely.

h. Count and describe the particles you see. Record this information on your _Air Quality Investigation_ sheet.

i. Compare your two collections. Do you notice anything different?

j. Optional: You can also measure air particles in different places, such as inside your home, next to a highway or factory, in a parking lot, or in a natural setting. Compare what you find to the air particles outside your home or school.

You may have been able to see some particles you collected. If you collected a lot of particles, this can be a good clue that a place may a lot of particulate matter.

However, the most dangerous particulate matter is so small that people cannot see it. Particulate matter is often classified by size. A **micrometer** is a millionth of a meter and a way to measure things that are microscopic. Particulate matter that is 10 micrometers or less is known as PM_{10}. Particulate matter that is 2.5 micrometers or less is known as $PM_{2.5}$. As a comparison, the average width of a human hair is 70 micrometers. This means the width of a hair is at least 7 times larger than PM_{10} and at least 28 times larger than $PM_{2.5}$. The smaller the particle is, the more likely it is to enter the body through the lungs. This can cause serious health problems in many parts of the body.

In this investigation you can find out more about particles in the air in your community. Although people may not be able to see one piece of particulate matter, sometimes you can sometimes find evidence when there is a lot of particulate matter in one place.

Particulate Matter Observation

a. Search for clues showing problems with air particles.
b. Examine outdoor walls or other surfaces. These surfaces can start to blacken if they are exposed to dark air particles, like those found in smoke or tailpipe emissions from cars and trucks. Finding walls that have blackened over time can be a sign that an area has a lot of particulate matter pollution.
c. Record any evidence you find of particulate matter pollution on outdoor surfaces. For example, maybe you could take a picture such as the one shown in Figure 17.
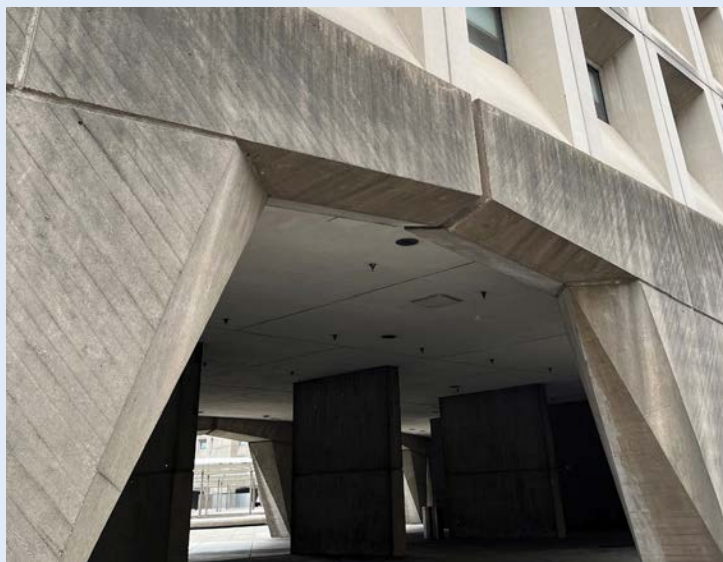
Figure 17: A building wall blackened over time by particulate matter in the air.

d. If possible, go somewhere high up and try to look far away. Particulate matter in the air makes it harder to see over long distances. Consider:

- Is it clear and you can see quite far?
- Is it hazy and you cannot see very far?
- What color is the sky?

e. Your community may measure local amounts of PM_{10} and $PM_{2.5}$ as part of measuring air quality. If you can, find out the PM_{10} and $PM_{2.5}$ levels in your local area over the last year and record that information on your *Air Quality Investigation* sheet. Sometimes air quality information is shared along with predictions about the weather. Sometimes this information is shared on government or other websites. If you have a smartphone there are apps you can download that have information about daily air quality in different places. You can find some of these resources on the *Environmental Justice!* StoryMap.

Particulate matter is just one measure of air quality. Other types of air pollutants that can harm your health include lead, asbestos, benzene, and mercury. These pollutants can cause cancer, birth defects, and other health issues. If you have time, you can also investigate whether there are other types of air pollutants in your local area. Finding data about air quality can help you learn more about whether air pollutants are a problem in your local area.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

- Do you think there is a problem with particulate matter in the air in your community?
- Why do you think some places have more particulate matter in the air and some have less?
- How do you think particulate matter may affect people who live in places with a lot of it?

Extreme Heat Investigation

Have you ever touched concrete on a sunny day? It can get very hot! Many parts of the human-built environment absorb heat from the Sun all day. The heat gets trapped in cities, creating **heat islands**. Having green spaces like parks or wild areas in cities can help reduce heat. You can use this activity to demonstrate.

a. Go to a spot where plants are next to a road, sidewalk, or other similar built surface. This will work best on a sunny day.

Figure 18: Plants next to a sidewalk.

> ⚠️ **Physical Safety Tip**
>
> If you are near a road, be careful of vehicles like cars and bicycles. Make sure you pick a spot to make your observations where you can be safe.

b. Put one hand or other part of your body on the built surface. Put one hand or other part of your body on the plants.

c. Feel both surfaces. Which is hotter?

d. Find a spot where a tree is shading an area. Go into the shaded area. Then move into the sun. Which is hotter?

Extreme heat is when a place gets so hot that it can affect the health of people living there. This may be different in different places. If your body is used to living in a place where it is hot a lot of the time, you may be able to still feel healthy when it is quite hot. If your body is used to colder weather, you may start to feel unwell sooner. You can find out more on the _Environmental Justice!_ StoryMap.

a. Get out a piece of paper or open your notebook. Title the page "Extreme Heat Investigation."

b. Find a map of your local community.

c. Do some areas have more green spaces than others? Make a record of the areas that have the most and least green spaces.

d. Do some places have many more trees shading the streets and homes? Make a record of the shadiest and least shady areas.

The air around a built-up space tends to be warmer than the air around a natural space. Built spaces absorb and then release more heat from the Sun. Plants reflect more heat, helping to keep the air cooler. Plants also help make the air cooler by providing shade. This prevents some of the energy from the Sun from reaching that area.

Extreme heat is not just unpleasant, it is a major health concern. Extreme heat can lead to dehydration and heatstroke. It also can make other health conditions worse and cause stress. As climate change causes temperatures to rise, extreme heat becomes more common.

a. Draw two columns on your _Extreme Heat Investigation_ sheet. Write "Year" at the top of one and "Days of Extreme Heat" at the top of the other.

b. With your team, think about how hot it has to be outside before you are really uncomfortable. Decide on that temperature as the measure of extreme heat in your community.

c. Try to find a record of daily temperatures in your community. You may be able to use a website or library records to find this. Some resources are listed on the _Environmental Justice!_ StoryMap.

d. Examine the temperature data from your local area. It would be best if you could use data over five to ten of the past years.

e. Write the year you are examining in the _Year_ column.

f. Each time there is extreme heat, count how many days in a row have extreme heat and write the number in the _Days of Extreme Heat_ column. When you have finished examining the entire year, add up the total number of days of extreme heat.

g. Optional: Go back 50 years and do steps e and f again for five to ten years. Compare your results to the more recent results. Are there more days of extreme heat now or 50 years ago?

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your _Justice Reflection_ sheet.

• Is extreme heat a problem in your community?

• Who do you think is most affected by extreme heat? (Hint: Think of the things you can do to deal with the heat, like going into air-conditioning indoors or cooling off in a pool. Who is not able to use these kinds of strategies to beat the heat?)

• How do you think extreme heat might affect other living things?

• Are there some parts of your community with many more green and shady spaces to combat heat islands and extreme heat?

Extreme Weather Investigation

There are many types of extreme weather or weather-related events. Some examples are hurricanes, typhoons, cyclones, tornadoes, drought, floods, dust storms, windstorms, ice storms, blizzards, mudslides, and wildfires. A changing

climate is increasing extreme weather events. In this activity you will investigate recent extreme weather events in your area.

a. Get out a piece of paper or open your notebook. Title the page "Extreme Weather Investigation." Draw two columns. Label one "Event" and label the other "Impact."

b. Try to find information about extreme weather events in your community. List the events and dates you find in the *Event* column. People may have talked about these events when you interviewed them. You may also have memories of these events. For example, maybe your community was hit by Hurricane Harvey in 2017. If so, write down "Hurricane Harvey, 2017" in the *Event* column.

c. Search for information about the impact of events. List this information in the *Impact* column. Try to answer these questions.

- Did people in your community die because of the extreme weather event?
- Were certain places affected more than others?
- Did people lose their homes or was there a lot of other damage to property? If you can find it, you can include an estimate of how much money the event cost.
- Did the event affect other living things?
- Are extreme weather events happening more frequently in recent years?

> ⚠️ **Emotional Safety Tip**
>
> It can be difficult to think about extreme weather events that may have harmed you or others in your community, It is okay to feel sad or upset. If you need to take a break, try using one of the ideas from *Taking Care of Yourself* in Task 1.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

- Is extreme weather a problem in your community?
- Who in your community was most affected by extreme weather events?
- Who was able to recover from the impact easily and who wasn't? For example, if an extreme weather event damaged property in your local area, are there some places where the property has not yet been repaired?

Design Your Own Investigation

There may be other environmental problems in your community you want to investigate. You can design your own investigation to find out information about these problems.

a. Pick the problem you want to investigate.
b. Think about the type of information that would help you understand this problem.

- Is the information something that can be measured or counted?
- Is the information something that can be described or categorized?

c. Discuss your ideas with your team and decide what you will measure.
d. Think what you will use to measure. Do you need any special equipment?
e. Plan your investigation. Where and how will you measure?
f. Conduct your investigation and record your data.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

- What did you learn about the problem you investigated?
- Do you think it affects everyone in your community equally?

Act: How can we use data to help us act?

The interviews you conducted in the Discover activity and the results of your investigations in the Understand activity are important. This data can help you make better decisions. It can also help you explain problems to others and **advocate** for change. To advocate means to recommend or support.

1. Think of something in or out of your community that you believe is a big problem that needs to change. You can use the Sustainable Development Goals from Task 3 to help give you ideas.
2. Now remember what convinced you this was a problem. Did you:

   a. Talk to someone who had experienced this problem?

b. Read or were told a story about how this problem affected a person or family?

c. Learn about the problem from someone you follow on social media?

d. Read or hear about statistics or other numbers that showed the problem was serious?

e. Learn about the problem from a person you trust, like a parent, friend, or teacher?

f. Have another experience or a combination of experiences?

3. Share your problem and what convinced you it was a problem with the rest of your team.

4. Discuss with your team:

a. What are the things that convinced a lot of people on the team?

b. If you want to help solve a problem in your community, why might it be important to convince others there is a problem?

5. With your team or individually, choose one of the environmental problems from your *Environmental Problems* table. You will now advocate to change and solve this problem.

6. Consider the information you have already gathered about the problem. Will this information help you convince others there is a problem? Remember the way you were convinced something was a problem in the past.

7. Read *Using Data to Show Environmental Injustices* and ask yourself how did data help the environmental justice movement in the United States in this example?

Using Data to Show Environmental Injustices

Collecting and sharing data about environmental injustices can be very important. In the United States, for example, in 1983 Dr. Robert Bullard researched the location of waste facilities in Houston, Texas. He discovered that the vast majority of garbage dumps, waste incinerators, and landfills were located in Black neighborhoods, even only 25 percent of the Houston's population was Black. When Dr. Bullard published his data, he brought national attention to the situation in Houston. He also helped inspire others around the country to start gathering and publishing data about environmental justice issues in their local spaces and across the United States.

8. If you need more information about your environmental problem, collect it now. Otherwise, decide exactly what information you will use. This could be stories you collected in the Discover activity, the results of investigations from the Understand activity, health statistics from Task 3, or any other information you have collected. If you decide you want to use someone else's story, make sure you ask them if that is okay. Sometimes stories are personal and people do not want to share them publicly.

> We need more data and people should have free access to it. But it's not just about the numbers—it's about the people! Data matters, but stories are also so important to motivate others and governments to take action against environmental injustice.
>
> —Margad Khasbat
>
> Margad Khasbat is a student from Mongolia and a volunteer at Breathe Mongolia-Clean Air Coalition. Her goal is to help create a safe and healthy environment for everybody in all the ways she can.

9. Decide how you will share the information. Remember the _Communication Strategies_ from Task 2. Which strategies fit best with the information you want to share? For example, if you are sharing the results you collected from your investigation, maybe you could use a data table, map, or infographic. Or maybe if you are sharing a story, you could use drama or dance.

10. Develop your communication strategy.

11. Use your communication strategy to convince another person or group that your environmental problem is a problem.

Task 5: What is causing environmental issues?

In this task, you will ***discover*** the immediate and **systemic causes** of environmental issues. Then you will learn more about a specific environmental issue in your area to ***understand*** the causes of this problem. Finally, you will ***act*** to find sustainable solutions by considering the perspectives of different people involved with the problem.

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Discover: *Why are there environmental issues?*

Thinking about the cause of a problem is important before you try to solve it. Imagine a situation where a river was polluted by chemicals. There may be a direct cause, like a company dumping chemicals into the river. However, there are often systemic causes as well. A systemic cause is a cause that's related to a whole system; it's bigger than one specific action. For example, systemic causes might be an economic or governmental system, **social norms**, or global environmental changes. There might be several systemic causes of the river being polluted by chemicals. Perhaps it's an economic system that pushes a company to care more about profits than a local river. Perhaps it's also a government that does not regulate dumping in waterways. Or perhaps social norms do not value the environment. Considering both the direct and systemic causes of a problem can help you understand it much better.

1. Read *What Is Causing the Breathing Problems?* It is a **case study** of an environmental problem faced by the people living in the city of Ulaanbaatar, the capital of Mongolia. A case study is when a specific example is used to understand a broader situation or process.

> ### *What Is Causing the Breathing Problems?*
>
> During the cold season, the city is filled with smoke. People cough and have respiratory problems. Many children struggle to breathe.
>
> Most of the smoke comes from burning coal. The local power plant burns coal to make electricity. If people do not have electricity in their homes, they often use

coal fires to cook and keep themselves warm. A lot of the smoke from these fires lingers inside the living areas. As it gets colder, people and the power plant burn more coal. The air fills with smoke. There is a lot of coal in the land surrounding the city, so it is easy to get and is not expensive.

Figure 19: Air pollution during the cold season in Ulaanbaatar, Mongolia.

The city is now much bigger than it used to be. Many of the people living without electricity used to live in the countryside herding animals. A changing climate has meant less rain, less grass, and more extreme weather in this area. This means it is difficult to keep animals alive and healthy. In the past, the government tried to help herders who lost their animals, but it no longer does. Herding has become too difficult for many families and there are not many other jobs in the countryside. So many families moved to the city. But even in the city it is hard to find jobs and afford housing. Many of the newer arrivals live in gers, traditional tent-like housing without electricity.

(Adapted from information from Breathe Mongolia)

2. Take out a piece of paper, open a digital document, or use a class board. Title it "Case Study Causes." You can do this activity individually or as a team. Draw a circle on one side. Inside this circle write or draw the main health problems you read about in *What Is Causing the Breathing Problems?* If you need an example go to Figure 20.

3. Next to the problem draw another circle or circles. Inside these circles write the environmental cause of the health problem described in the case study. For example, if the health problem is respiratory problems and diseases, then the environmental cause might be smoke in the air.

4. Next to each environmental cause draw another circle or circles. Inside these circles write down the situations directly causing the environmental problem, as described in the case study. In the graphic these are shown as direct causes. For example, if the immediate cause is smoke, then you would list what is causing that smoke, such as people burning coal fires at home. If there is more than one answer, list them in separate circles.

5. For each direct cause, think about the bigger habits or situations creating that direct cause. These are the systemic causes. For example, people burning coal fires at home is a direct cause; what is causing people to do that are the systemic causes. There may be several systemic causes. List each of them in separate circles.

6. Keep asking why each cause exists and list the answer or answers in circles next to the previous cause. Keep going until you can't think of any more ideas.
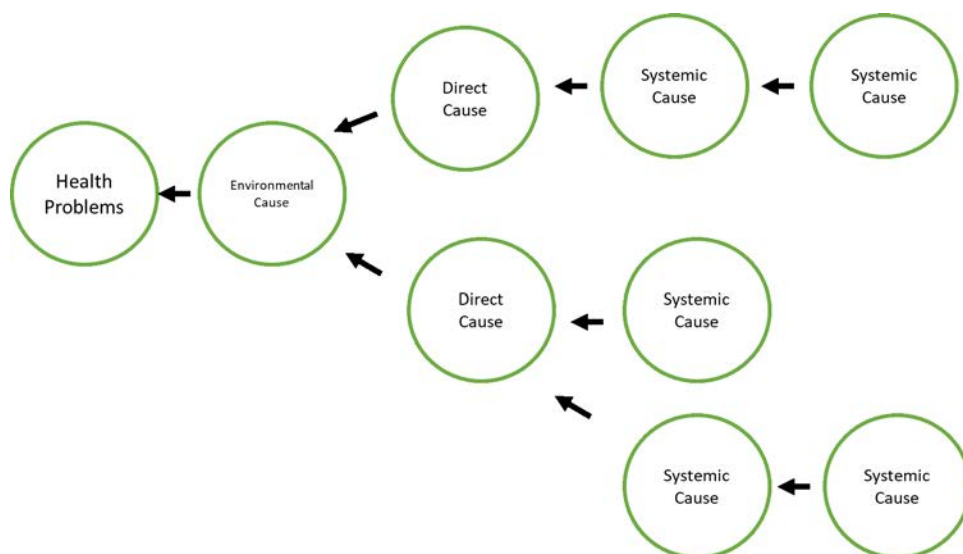
Figure 20: Example of a Case Study Causes sheet.

7. Read *Systemic Causes*. If you think of any additional causes while reading, add them to your *Case Study Causes* sheet.

Systemic Causes

The four perspectives can help when you think about systemic causes. If you do not remember the four perspectives, you can read about them in Task 2. Now think for a moment about the systems related to each perspective and consider the questions for each type of system. Think about how you would answer them for your community. For example:

- **Social Systems**
  - How and where do people interact? What behavior is acceptable?
  - What is the culture?
  - What are the possibilities for education and health care?
  - Who makes decisions?
  - Are people able to pick their leaders and influence the decisions they make?
  - What role does the government play in daily life and environmental protection?
- **Economic Systems**
  - What types of jobs do people have?
  - Do people have enough money to meet their needs?
  - Is there a lot of economic inequality?
  - Are there any restrictions or regulations on businesses?
- **Environmental Systems**
  - How is the changing climate affecting the situation?
  - Is global pollution part of the problem?
  - What are the attitudes people have about the environment?
- **Ethical Systems**
  - What is thought of as fair?
  - Are some people treated differently or have different opportunities because of characteristics like the color of their skin, their gender, their sexuality, age, income level, or disability?

8. Examine your *Case Study Causes* sheet with your team. Discuss with your team whether you think some of the systemic causes you found might also be causes of environmental problems in your local area.

9. **Justice Reflection:** Discuss with your team whether the case study shows any examples of environmental injustice. If so, you may want to record these examples on your *Justice Reflection* sheet.

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Understand: *What is causing one environmental problem in my community?*

You have gathered data and stories about environmental and health problems in your community. As action researchers, you can now pick one environmental and health problem to investigate further.

1. Pick a problem from your *Environmental Problems* table for further research. You can choose the same problem you communicated about in Task 4 or a different problem. Try to pick a problem that you think is both interesting and important.

2. Use the example from Figure 20 to create a *Causes Analysis* sheet like the *Case Study Causes* sheet from the Discover activity.

3. Fill in the information you know about the health problems, environmental causes, direct causes, and systemic causes. Don't worry if you are not sure about some or all of the causes of your problem.

4. Examine what you know and don't know about the causes of the problem you picked. Choose an investigation or investigations to help you find out more about what is causing the problem in your community.

Site Inspection Investigation

Environmental problems sometimes come from a specific place or site, like a waste dump, power plant, or factory. If you think your environmental problem comes from a site, you may want to investigate to find out more.

a. Get out a piece of paper or open a page in your notebook. Title the page "Site Inspection Investigation."

b. If you are able to and it is safe, travel to the site.

> ⚠️ **Physical Safety Tip**
>
> Talk to your teacher or another trusted adult before you go. Never go alone and always be aware of your surroundings.

c. Observe, carefully make notes and, if possible, take pictures of things you think might be causing the environmental problem.

d. If traveling to the site is not possible, you may be able to find out more from a person or organization who has traveled to the location. Use the Internet or a library to search for additional information.

e. You also may be able to use satellite maps like those available on the Internet. If you search carefully, you may be able to find evidence of a problem. For example, when power plants burn coal they end up with coal ash as a waste product. This ash contains toxic chemicals that can pollute **groundwater**. Coal ash is sometimes stored in ponds near rivers or streams. If you notice a coal ash pond near a body of water on a satellite picture, that might be a source of water pollution.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

- What would it be like to live near these sites?
- What kinds of problems do you think it might cause for people living nearby?

Change Over Time Investigation

If you think the environmental problem has gotten worse over time, you may be able to investigate what has changed to find out what is causing the problem.

a. Get out a piece of paper or open a page in your notebook. Title the page "Change Over Time Investigation."

b. Draw a timeline. Think back to the *Environmental Interviews* from Task 4. If people mentioned changes and you know when those changes happened, add them to the timeline.

c. Consider other sources that could tell you about changes in your community, for example, old newspapers, community newsletters, or reports on businesses.

d. If you have access to the Internet, you can use a mapping tool to look at how your community has changed over the years. Pay close attention to things that were built. Are there more roads and industrial sites, or fewer green spaces? Has anything changed that might be causing the problem you picked? For example, maybe a highway or bus depot was built in your community 10 years ago. If air pollution is a problem, vehicle emissions may be one of the main causes.

Justice Reflection: Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

• Do the results of your investigation show that some people living in some parts of your community have had more negative changes than others?

• How have the changes affected other living things?

Population Investigation

A **population** is a group of people with something in common, such as the place they live. Sometimes knowing who is affected by a health condition and studying what these people have in common can help you find out the cause of the health condition. For example, maybe many people with one type of cancer all work at the same place. This might be a clue that something in the workplace could be causing the cancer. Or maybe many people who ate on the same night at the same restaurant had upset stomachs. This might be a clue that the food in the restaurant could be causing the stomach upsets. In this investigation you will look for clues connecting a population to help find causes of a health condition.

a. Get out a piece of paper or open a page in your notebook. Title the page "Population Investigation."

b. Using the Internet, the library, or a local expert such as a doctor, investigate the health problem. Are certain people more likely to have these problems? Be sure to think about:

- Location: Do some places in your community have people who have the health condition more often?
- Work: Is the health condition often found in people with the same job? For example, agricultural workers may be exposed to a lot of pesticides that can make them sick.
- Age: Does the health condition affect people of
- one age more than others?
- Shared interest: Did the people who have the health condition do or use something in common? Do they all go to the same school, swim in the same lake, or use the same skin product? These can be clues about what might be causing the health condition.

Thinking about Causation

Causation is when one thing causes another. Two things happening to the same group of people does not prove that one causes the other. For example, if many elderly people get an illness, it may not be caused by anything related to their age. However, it might be a clue that may make you want to investigate further. You can do further research about who is most affected by the health condition and use that information to help search for causes.

Justice Reflection: Do the results of your investigation show that some people in your community are more at risk? If so, record that information on your *Justice Reflection* sheet.

Access Investigation

Sometimes problems are caused by decisions made by other people Problems can be caused by too much of bad things like air pollution or exposure to toxic chemicals. Problems can also be caused by not being able to easily reach or have **access** to good things, such as clean water, education, health care, healthy food, and green spaces.

a. Get a map of your local area that you can write or draw on.
b. If everyone has clean water inside their home, move on to the next step. If not, use a colored pencil or pen to circle where you can go to get clean water.
c. Using a colored pen or pencil, circle all the locations related to education, like a school.
d. Using another color, circle all the locations related to health care, like a pharmacy, doctor's office, or hospital.
e. Using another color, circle all the locations where you can buy healthy food, like a market with fresh fruits and vegetables.
f. Using another color, circle all the locations that are green spaces, like a park or nature reserve.

Figure 21: Example of an <u>Access Investigation</u> map with different types of locations marked in different colors.

g. If there are any locations you circled that are not available to everyone in your community, draw an X over those circles now. For example, maybe there is a school that only some people are allowed to attend. Draw an X over that circle.
h. Examine your map closely. Are there places where it would be difficult to access education, health care, healthy food, or green spaces? If so, mark that area.

If you have places in your local area with low access, that may be one of the causes of your environmental or health problem. For example, if obesity is a problem in a place, it could be linked to difficulty in accessing healthy food.

Justice Reflection: Do the results of your investigation show that some places in your community have less access to services? If so, record that information on your *Justice Reflection* sheet.

Social Norms Investigation

Every place has certain social norms. Social norms are ideas or ways of behaving that are generally acceptable in a place. Social norms can sometimes prevent an environmental problem, like if it is the social norm to respect a nature preserve. Social norms can also cause environmental problems, like if it is the social norm to use and throw away a lot of plastic.

a. Get out a piece of paper or open a page in your notebook. Title the page "Social Norms Investigation."

b. With your team, list all the habits, ideas, and behaviors you can think of related to your problem.

c. Find some other community members to talk to. It would be best to find people with different perspectives, just like you did with your *Environmental Interviews* in Task 4.

d. Ask your community members about which social norms relate to the problem you picked. Why are these the social norms? Record your answers on your *Social Norms Investigation* sheet.

e. Add any additional causes you discovered to your *Causes Analysis* sheet.

Justice Reflection: Are there social norms that assume one group is more powerful or important than another? If so, record that information on your *Justice Reflection* sheet

5. Reread the *Systemic Causes* box from the Discover activity. Add any systemic causes you can think of to your *Causes Analysis* sheet. Consider global as well as local causes.

6. Examine your *Causes Analysis* sheet closely. If any of the causes are related, draw an arrow between them. For example, maybe several causes are related to the economic system or social norms in your community.

Task 5

Act: *Who would need to be involved to create change?*

After understanding the causes of a problem, you can start thinking about how to solve it. When one person designs a solution alone, it is easy to miss important ideas or information. Sustainable solutions balance different perspectives and are able to last a long time. People who are deeply interested or will be affected by a change can work together to find sustainable solutions. In this activity you will think about different people in your community who have different perspectives. We will use the word **shareholder** to describe people who share a problem and should be involved finding a solution.

1. Consider the environmental problem from your *Causes Analysis* sheet. As a team, use a piece of paper to make a list of shareholders for this problem. Think about the people or organizations who would care about solutions to this problem. Be sure to consider:

   a. People who are directly affected now. For example, people with the related health problems or people living where the environmental problems is happening.

   b. People who might be directly affected in the future. If an environmental problem is getting worse, think about who might be affected 5, 10, or 20 years from now.

   c. Local, regional, or national government representatives.

   d. Organizations that help fight some of the causes you listed in your *Causes Analysis* sheet.

   e. People or organizations involved in creating the environmental problem. For example, if a business was creating products with toxic chemicals, they need to be part of the conversation about how to change that.

   f. Researchers who have gathered information about the problem and causes.

   g. Local communicators, such as members of the media or others whose opinions are respected by people in your area.

2. Count the number of shareholders you listed. You need one shareholder role for each team member. If you have more people than roles, write down the roles you think are most important multiple times. If you have more roles than people, just use the roles you think are most important.

3. Tear the paper into slips, with one shareholder role listed on each slip.

4. Have each team member pick one of the slips. You will now play this role in a community meeting. The goal of this meeting is to find a solution that will help address the problem in a sustainable way.

Figure 22: Example of a shareholder meeting.

5. Before you begin, take a moment to reflect on your role. You may want to make some notes. Remember, you are not representing your personal perspective, you are representing the perspective of the shareholder. Ask yourself:

   a. What do I (the shareholder) want?

   b. What am I worried about?

   c. What is the most important cause I would like to address?

   d. What kind of solutions would I like to see for this problem?

   e. What are some things that might limit me, such as money, time, or lack of support from other people?

6. Form a circle with your team.

7. Go around the circle and have each shareholder explain what success would look like from their perspective. For example, maybe the business owner who is creating a toxic product feels success would mean keeping customers happy without losing profits or cutting jobs.

8. After everyone has shared their idea for success, have one person start by proposing a solution. Others can share whether they agree with, disagree with, or want to suggest a change to the solution, and why.

9. If the first solution shared does not work, have someone else suggest a different solution. Keep talking as a group until you can find a solution that seems acceptable to everyone.

10. When you are finished, present your solution to another team or a teacher or other adult. Share with them:

   a. How did the group decide this was the best solution?

   b. How did having different shareholders as part of the conversation change the solution?

11. **Justice Reflection:** Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

   a. Was there anyone involved in finding the solution whose ideas or opinions were ignored?

   b. Are there shareholders who might be ignored or not represented in your community when decisions are made?

   c. Are there shareholders who cannot participate in decision-making, such as very young children or other living things?

Task 6: How are the impacts of environmental problems unjust?

People suffer unequally from environmental problems, often due to decisions made by others. In this task you will **discover** the themes of injustices you have noticed. You will research to **understand** more about an environmental injustice in your local area. Then you will find out how to **act** and improve the injustice.

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Discover: *How does discrimination connect to environmental injustice?*

Discrimination is when one group is treated unequally compared to another group. Sometimes people are discriminated against by not having equal opportunities. This could be the opportunity to get a job or to be treated fairly in a workplace. This could be the opportunity to buy or rent safe housing in the area of their choice. This could be the opportunity to participate in making local, national, and global community decisions. Discrimination can often lead to environmental injustice.

1. Read *Discrimination and Injustice*.

Discrimination and Injustice

Sometimes people are discriminated against because of an identity they have, such as their race, ethnicity, gender, sexuality, income level, religion, age, or disability. Often when people are discriminated against they are not included in decision-making. This is wrong. Everyone deserves to be involved in the decisions that will affect their lives.

Decisions have consequences. Decisions made in the past may still have consequences now. Some decisions made in the past, such as where people are allowed to live or changes made to the environment, have consequences that last a long time. In one example, because of their race some people were purposely left out of a decision to build a chemical factory near their homes. If the chemical

factory pollutes the air, water, or soil, then years later these people may suffer unfairly from health conditions such as cancer because of this pollution.

When power is shared unequally and decisions do not include everyone affected, the consequences of those decisions can last for many years. This is not just.

2. With your team, on your *Justice Reflection* sheet, make a list of examples you know about where past actions that discriminated against a group still have consequences now. This might be in your own local community or from situations and histories you know about from other places. Be sure to consider:

   a. Discrimination based on race

   b. Discrimination based on gender

   c. The impact of a **colonialism** on the Indigenous people of a place. Colonialism is when one country or group tries to control another place or people either by physically occupying the place or by using force, money, or power.

   d. Discrimination based on other factors, such as religion, sexuality, national origin, or income level

   ⚠ **Emotional Safety Tip**

   It can be upsetting to think about people being treated unfairly. If you need to take a break, use the <u>Taking Care of Yourself</u> ideas from Task 1. Discrimination has been happening for a long time and is not your fault. However, you can be part of the solution and can help make the future more just.

3. **Justice Reflection:** Discuss the questions below with your team. If you have ideas you want to remember, record them on your *Justice Reflection* sheet.

   a. What are some current consequences of people being discriminated against in the past?

   b. Are there decisions being made without your involvement right now that will affect you in the future?

   c. Are there other groups in your community that may not be involved in making decisions that will affect them?

4. Now examine your *Justice Reflection* sheet and your *Environmental Problems* table closely. Think quietly to yourself:

    a. Are there examples you found of injustices in your local community?

    b. Are there examples you found of global injustice?

    c. Which examples do you think are most important to share with others?

5. Pick one example of an injustice. Make sure you pick a different example than your teammates.

6. Consider how you can represent this injustice. For example, could you take a picture? Could you use the words of someone who has experienced this injustice?

7. On a board, a large sheet of paper, or a shared digital space, create a piece of collaborative art with your team. Each person can add pictures, drawings, words, symbols, or other ways of sharing the injustice they picked to represent.

8. As a team, examine the artwork you all made.

    a. Are there intersections or connections between the injustices that you would like to add? Maybe many injustices are due to an environmental problem like climate change. Or maybe many of the injustices are related to discrimination such as racism or sexism.

    b. Are there ways you could add those ideas to your collaborative artwork?

    c. Are there themes you notice? Share your ideas with your teammates.

> Environmental justice issues are social justice issues, they are gender equity issues. These concepts are deeply connected and often include intersections between different types of discrimination.
>
> —Andrea Kim Neighbors
>
> Andrea Kim Neighbors is the Manager of Education Initiatives at the Smithsonian Asian Pacific American Center. Her motivation is to see a future where young students see themselves reflected in what they're learning in school, and that all students have opportunities to learn about Asian American and Pacific Islander stories across the US.

9. Keep your collaborative artwork displayed to help inspire you to take action.

Understand: *How does discrimination affect people in my community?*

People may live in the same community but be treated unequally. In this activity you will think about who is in your community. Are everyone's thoughts and ideas considered when decisions are made? What and who is valued the most when decisions are made in your community?

1. With your team, take out a piece of paper, use a class board, or open a shared document. Title it "Community Identity Map." Write the name of your community in a circle in the middle.

2. Take out your *Identity Map* from Task 1. Examine it closely. You are an important part of your community.

3. Pick an identity that's important to you from your identity map and add it to your *Community Identity Map*. After everyone adds something, your *Community Identity Map* will represent identities from your whole team.

4. Think about what other identities you need to add to represent your whole community. If you know of other identities that should be part of your *Community Identity Map,* add them now. For example, maybe you know many people in your community work at one place or have a shared culture. You can add those ideas to your *Community Identity Map* now.

5. You also need to find out what you don't already know about the people living in your local area. Discuss with your team:

   a. How could you find out who else lives in your community?

   b. Think back to your *Identity Map* categories from Task 1. What kind of information would be important to know about your community?

   c. Which groups were not included when decisions were made in the past or are not included now?

   d. How do you think that has affected people who were left out of making decisions?

6. Pick a way to further investigate identities and experiences with injustice in your community. For example, you could:

   a. Use the information you collected in your interviews from Task 3.

b. Conduct a community **survey**. A survey is a list of simple questions that you can give to a group of people. The *Environmental Justice!* StoryMap has more information about how to conduct a survey, if you need support.

c. You can investigate using books, lists, videos, maps, artwork, audio recordings, historical documents, community websites, or other records of who lives in your community.

d. You can think of your own way to collect information. You could combine more than one way (for example, you could collect information from books and videos and give a survey) or create a new way to collect information.

7. Decide as a team how you will investigate.

8. Plan your investigation with your team. For example, if you decide to pass out a paper survey, decide who will type or write the survey, who will make copies, who will pass the survey out, who will collect the finished surveys, and who will keep track of the answers.

9. Conduct your investigation with your team.

10. Add the identities you found to your *Community Identity Map*.

11. Examine your *Community Identity Map* and discuss with your team:

a. From what you know, have any groups in your community been left out of decision-making in the past?

b. Are any groups still left out of decisions that will affect them?

12. With your team, pick one environmental problem your community recently made a decision about.

13. Research how decisions were made on this problem. For example, you might:

a. Talk to people involved in making the decision.

b. Talk to people who were not involved in making the decision.

c. Talk to groups who might be interested in the decision.

d. If decision-making meetings were public, try to find a recording or someone who attended the meeting.

e. Read news or other reports on the decision.

14. As a team, answer the following questions.

a. Who made the decision?

b. Do the decision-makers represent different identities that make up your community? For example, if there are nine decision-makers and only one identifies as female, that is probably not representative of the people living in your community.

c. Were there people who wanted to influence the decision but were left out?

d. Were the people who will be most affected by the decision given the most power?

A few decades ago in areas across the country, due to housing laws (like **redlining**) and home affordability, people of color could only buy homes in neighborhoods where the government knew were exposed to toxics in the ground. The impacts of living in a toxic place accumulate in each generation and children's smaller bodily organs can react stronger to chemical exposure. Generations grew up knowing that the health of their community was and is compromised due to past government decisions on home ownership.

—Danielle Simms

Danielle Simms was formerly the National Advocacy Manager for WE ACT for Environmental Justice. She is an environmental justice and climate advocate, and her motivation stems from a desire for justice and to protect our public health as well as an interest in ecology, especially endangered species.

15. **Justice Reflection:** You can write down the answers to these questions on the *Justice Reflection* sheet or just discuss with your team.

a. Do you feel decision-making is just in your community?

b. If not, how would you like to change it?

Act: *What progress has already been made and what needs to happen next?*

People have been fighting for environmental justice for a long time. Even though they may not have used the words "environmental justice," people throughout history have

been trying to protect themselves, their families, and others from environments that might harm their health or well-being. As you start to fight for environmental justice as well, it is important to realize how people in your community are already working for environmental justice. Then you will know how to join your efforts to theirs so even more progress can be made. Each country and often local area have their own history of fighting for environmental justice. Whether or not it is your history, it can be valuable to learn about the efforts made by different groups in different places.

1. Read *Timeline of the U.S. Environmental Justice Movement*.

Timeline of the U.S. Environmental Justice Movement

Since the 1960s, groups in the United States have been fighting for environmental justice. This is a small set of examples showing different ways and groups that have been involved in that fight.

1968: In Memphis, Tennessee, sanitation workers, largely African American, strike for better working conditions.[4]

Figure 23: Memphis sanitation workers on strike holding signs that say "I Am a Man".

1960s onward: United Farm Workers use strikes, boycotts, and nonviolent protests[5] to advocate for better working conditions for farm workers, including reducing exposure to pesticides.

Figure 24: Dolores Huerta speaks at a United Farm Workers rally in 1970.

1979: In Houston, Texas, a group of Black homeowners file a class action lawsuit alleging environmental discrimination over the placement of a landfill near local schools.[6]

1982: A large nonviolent protest tries to halt a landfill for the toxic chemical PCB from being placed in a rural, largely Black community in Warren, North Carolina.[7]
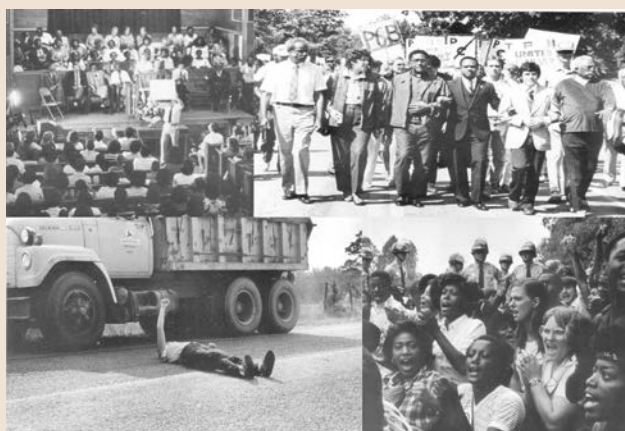

Figure 25: Citizens of Warren County in North Carolina created the Warren County Citizens Concerned with PCBs group, held meetings, conducted voter registration, and peacefully protested the PCB landfill.

1980s: Data collection and analysis[8] studies show that hazardous waste sites are often placed in or near communities of color. These studies are published and shared with the public.

1986–1990: Activists found groups dedicated to building healthy environments by making sure people of color and low-income residents are able to participate in environmental decision-making. Some start in local areas, such as WE ACT[9] in West Harlem, New York, and Mothers of East Los Angeles[10] in California. Others are national and even international, such as The Indigenous Environmental Network,[11] formed to bring together Indigenous people to work collectively to protect their sacred sites, the environment, human health, and the health of all living things.

Figure 26: Members of Mothers of East Los Angeles take part in a protest march.

1990: A group of U.S. lawmakers interested in issues that affect Black Americans, the Congressional Black Caucus, meets with the Environmental Protection Agency to discuss the links between environmental risk and race in the United States.[12]

1991: The First National People of Color Environmental Leadership Summit adopts the Principles of Environmental Justice,[13] providing guidance to the developing environmental justice movement.

1992: Xavier University in Louisiana founds a center for environmental justice.[14] The University of Michigan founds an undergraduate and graduate environmental justice program of study.[15]

1992: The Office of Environmental Equity, later changed to Environmental Justice, is established at the U.S. Environmental Protection Agency.[16]

1994: Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal government agencies to consider environmental justice when making decisions.[17]
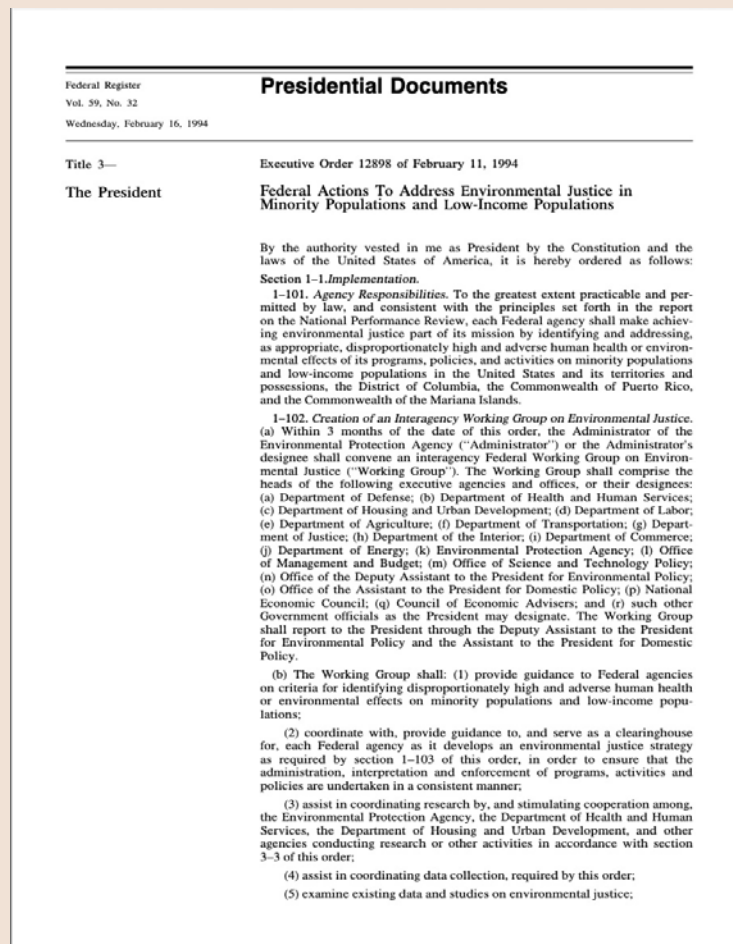
Figure 27: The first page of the 1994 Executive Order addressing environmental justice in minority populations and low-income populations.

2015: EJScreen is launched.[18] It provides a digital tool to examine data related to environmental justice in the United States.

2015: A court case, *Juliana v. United States*,[19] is filed by 21 young people. The lawsuit alleges that the United States government is responsible for its "affirmative actions that cause climate change." And by acting in this manner, the case says the U.S. government has violated the rights to life, liberty, and property of today's youth. In 2019, tens of thousands of people and groups file supporting documents with the court encouraging the case to go forward.

2016: Indigenous and other groups set up a camp near Lake Oahe, North Dakota, protesting the planned Dakota Access Oil Pipeline.[20] They attempt to halt construction because of the risk to their drinking water and damage to sacred sites.

Figure 28: The Dakota Access Pipeline.

2018: FridaysForFuture and other organizations protest climate injustice through youth school strikes and other activism tools.

2021: *The Guardian* newspaper launches a yearly series called the Dirty Divide, which shares stories of environmental injustice in the United States.

2. Think quietly to yourself about these examples.
   a. Are there examples that you connect to personally?
   b. Are there examples that felt very powerful to you? Why?

3. Examine the examples of actions shared in *Timeline of the U.S. Environmental Justice Movement*. Discuss with your team:

   a. What are some of the ways people have taken action for environmental justice?

   b. What inspired different people and groups to become active in working for environmental justice?

   c. How did later actions build on earlier actions?

Most likely there is already something happening in your country that you could get connected to. A lot of things on social media give you an opportunity to connect. You can follow and interact with accounts in different countries. Social media has been such a valuable tool to reach people and share resources. You could also start something with your friends or in your school. There are usually environmental clubs already in schools, so you could just go to that and push for more, if it isn't going in the direction you want.

—Mitzi Jonelle Tan

Mitzi Jonelle Tan is the convenor and international spokesperson of Youth Advocates for Climate Action Philippines. She is committed to fighting alongside the most marginalized for a system that prioritizes people and planet, not profit.

4. Now think about your own local community. Do you know of any community groups working for environmental justice? Pick one of these people or groups to learn more about. If there are no groups at your local level, you might be able to find some national or international groups working on your issue. Partnering with others can help you work toward collective action.

5. Research with your team. Perhaps you could talk to someone from an organization or examine their website.

   a. How did they get started and what is their history?

   b. What are they doing now?

   c. How do they work with others to accomplish their goals?

> There are people of all backgrounds fighting for environmental justice. We should share the stories, names, and faces of the people involved in the environmental justice movement. I think what they are doing is just as important as what was done for civil rights and what is being done for social justice and they should be recognized.
>
> —Christopher Williams, PhD

6. Think about the action you came up during your shareholder meeting in Task 5.

   a. Are any groups doing something similar?

   b. How could you work with existing groups to make your actions more effective?

7. Reach out to the group you identified and see if they are willing to talk with you. If you can, explore the possibility of working together for environmental justice.

Task 7: What can be done?

We all have the ability to make choices. That means each individual and group has a role to play to achieve the goal of environmental justice. In this task you will **discover** some of the ways groups can choose actions that encourage or discourage environmental justice. You will learn more, so you can **understand** some innovative solutions to environmental problems. Finally, you can join other young people to **act** for environmental justice.

Discover: *How can different groups help or hurt?*

Every individual and group can affect environmental justice in their local community and around the world. The world can become more or less environmentally just, depending on the decisions people make and the actions they take. A group can help or hurt the cause of environmental justice.

1. Take out your *Environmental Problems* table and examine it closely to remind yourself of environmental problems in your area.

2. Divide your team into pairs.

3. Assign each pair to one of the groups listed below. If you have more than 10 pairs, you can add additional groups. If you have fewer than 10 pairs, each pair can take more than one of the groups listed below.

   a. A group of young people your age

   b. A group of older adults

   c. A group of researchers

   d. A local organization working for a better environment

   e. A local organization working against injustice

   f. A local business

   g. A multinational company that does business in many countries

   h. Your local government

   i. Your national government

   j. The United Nations

4. Have each pair present to the team about ways their group could help or hurt. One person will be the hurt side of the pair. The other person will be the help side of the pair.

5. The hurt side of the pair should share with the team three ways their group could hurt or make environmental justice worse in your area. The questions listed here can help you think of ways the group can hurt. If a person gets stuck or can't think of any more ideas, their teammates can help.

   a. What actions could the group take that would hurt the natural environment?

   b. What actions could the group take that could worsen injustices?

   c. Are there ways the group could make situations more unjust without meaning to?

   d. How might the group use their influence or communicate in a way that would hurt environmental justice efforts?

6. Now the help side of the pair should share with the team three ways their group could help environmental justice in your area. The questions listed here can help you think of ways the group can help. If a person gets stuck or can't think of any more ideas, their teammates can help.

   a. What actions could the group take that would protect the natural environment?

   b. What actions could the group take that could help make the world or their community more just?

   c. Who might this group be able to influence to join them in working for environmental justice?

   d. How might the group communicate in a way that would help environmental justice efforts?

7. Go around the room and have each group share.

8. Pick one environmental problem from the _Environmental Problems_ table. Discuss with your team:

   a. Which of these groups would you want to influence, if you were trying to fix this problem?

   b. What ways do you think you could influence this group?

Understand: *What are ways of addressing this problem?*

One way people and groups can help solve problems is through **innovations**, or new ideas or methods of doing something. New science, technology, engineering, and math (STEM) innovations can help provide technical solutions to environmental problems. Sometimes rules or actions can change to help solve an environmental injustice. Government rules and actions are called policies.

1. By yourself or with a partner, pick one environmental problem you have learned about. What are some areas in this problem where someone might be able to innovate and create a new solution? For example, if there is a problem with water pollution and drinkable water in your area, how could that be made better through a STEM innovation. Be sure to consider:

   a. Ways in which STEM innovation could help identify or gather better data about the problem.

   b. Ways in which STEM innovation could prevent the problem.

   c. Ways in which STEM innovation could help make the problem better.

2. Pick one of the innovation possibilities. If you had to solve that problem, what would you do? Write a description, draw a picture, or use another method to show how you might solve the problem.

3. Now search for scientific and technical innovations that are already in progress. Use the *Environmental Justice!* StoryMap, the Internet, a library, or places where the problem is happening to search for existing innovations. Are there things that people have already invented to help solve this problem?

4. Think again about policy solutions to the same environmental problem.

   a. Can you think of actions or rules the government could make to make things fairer?

   b. What policy innovations do you think could happen to make the impact of the problem more just?

5. Come up with one policy idea to make the environmental situation in your community more just.

6. Now search for policy innovations already in progress. Use the _Environmental Justice!_ StoryMap, the Internet, a library, or places where the problem is happening to search for existing policy innovations. Are there policy innovations people are already using?

7. Report back to your team about your ideas and the existing STEM and policy innovations you found.

Act: _How have other young people helped?_

Many young people are already contributing to making their communities more environmentally just. There are many areas for these contributions and many ways to contribute. Some youth are changing their own behavior. Some are creating new scientific or technical solutions. Some are advocating for government policy change at a local, national, or global level.

1. Pick one young person who is active in the environmental justice movement to learn more about.

    a. The _Environmental Justice!_ StoryMap has videos from young people around the world that you can watch to find a person who inspires you.

    b. Or you can find a young person from your local area to learn more about. Maybe there is someone you know about or can interview.

2. Learn everything you can about the person you picked.

    a. If the person is from the _Environmental Justice!_ StoryMap you can watch their video and maybe find out more about them on their social media accounts.

    b. If the person is from your local area, you might be able to interview them, talk to others who know them, or find local news stories about them.

3. Think about what inspires you about the person you picked. How can you use their example to help you take action?

> Although it is scary, there is something that can be done and that is already being done to help the environment. There are things that are being done by people who are your age, people who look like you, people who are the same color as you.
>
> —Mitzi Jonelle Tan

4. Create a meme, gif, comic, podcast, poster, poem, or another way to communicate your inspiration to act with others.

5. Share your creation with your team and other community members.

Task 7

Task 8: How will we act?

Understanding a problem is important. But more important is what you will do with that understanding. In this task you will ***discover*** which problem you want to change. Then you will learn more, to ***understand*** how to reach your goal. Finally, you will ***act*** on your plan and start to create change.

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Discover: What will we do?

You have learned about many different problems in your community. You may want to solve all these problems. But it can be difficult to solve many problems at one time, so it is best to pick one problem to start with.

1. Start by reading *Guidelines for Taking Action*.

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Guidelines for Taking Action

- **Listen to others:** You may have some great ideas to help make your community better. However, also remember to listen to other people in your community who have been working on these issues for a long time. They may be able to guide you toward actions that would work best.
- **Involve the right leaders:** The people who are most affected by decisions are the people who should have the most power to make those decisions. If you are trying to help another part of your local or global community, make sure the people who are directly affected by the environmental injustice are involved in leading the way in finding a solution.
- **Inclusion:** The perspective of everyone on your team is important. Some people may have great ideas but may not feel comfortable speaking. Try to create an opportunity for everyone to participate in making decisions for your team.
- **Keep your goal in mind:** There are so many ways to contribute, and sometimes it is easy to be distracted. When you have decided on a problem that you want to work on, stay focused on that problem throughout your action. Remember, your goal is environmental justice.

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2. Take out your _Causes Analysis_ sheet. Is the problem you investigated one you would like to help fix? If not, decide with your team the problem you would like to help fix.

3. Now think about the problem you have picked. Take out a piece of paper or open a digital document to list the team's ideas about actions you could take to help fix the problem. Use these questions to help you think.

   a. What do you think are the most important causes to fix for this problem?

   b. What are some actions you could take to help make this problem better?

4. Remember some of the actions you read about in the _Timeline of the U.S. Environmental Justice Movement_. Discuss these questions with your team and record your ideas.

   a. Are there any actions you think were successful that you might want to consider?

   b. Are there any actions you would want to avoid?

Young people don't know how powerful we are. We can encourage others, raise awareness, and demand action from those who are making decisions. We have access to the Internet and media channels; we need to be active and vocal about these issues. Youth can volunteer with civil service organizations. Children should be able to sue the government for violating their rights. When some young students protested in the capital of my country recently, they were told to go away because they're "too young." Young people should be allowed to protest. A lot of young people here don't vote. Young people need to be more involved, use the Internet to search for the politician's promises, and make demands.

—Margad Khasbat

5. Remember in Task 7 when you thought about ways groups could help or hurt? Which groups will you need to reach to have the impact you want on your problem? Record these ideas on your list of actions from step 3.

> There is so much in the world of activism that you can do absolutely anything. The things you already like to do, the things you are passionate about, the things that bring you joy, those are things you can channel into that activism. You don't have to do everything. You don't have to be the person who is speaking, be the person who is writing, be the person who is doing all of this. If you are the type of person who wants to do background jobs, that is very important. There is really a place for everyone, and everyone is so welcome and needed.
>
> —Mitzi Jonelle Tan

6. Take out your *Identity Map* from Task 1 and examine it closely. Make a note of things about your identity that might help you decide how you would like to act. For example:
   a. Are you part of any groups that you could communicate with?
   b. Do you have any special talents, such as art or music, that might be useful to capture people's attention?
   c. Are you interested in science and engineering or other ways to try to find innovative solutions?
   d. Do you have good planning or organization skills?
7. Gather with your team. Write "Team Strengths" on a sheet of paper or on the board.
8. Are there other things about your identity that might help you work to solve an environmental justice problem in your community?
9. Under *Team Strengths*, write down all the ideas you had about things from your identity that might help you act.

10. Think quietly to yourself about the actions you listed from step 3. For each, action, ask yourself:

    a. Does the action help fix the cause of your problem or make your problem better?

    b. Is this an action your team can take? Think about your time, any costs involved, team strengths, and whether everyone can participate.

    c. Would you be excited to take this action?

11. As a team, discuss the actions you have listed. Get rid of any actions that would not be helpful or that you cannot do.

12. Share your ideas and listen to others. Come to a consensus about which action you will take.

> Change comes from community. No better place to start. With the young people we can and should change how they see the world and how they think about their role in the world.
>
> —Dr. Onyemaechi Nweke

Understand: *How will we do it?*

Planning is an important part of successful action. You will think about what you need to do, who needs to do it, and how you will partner with others.

1. Think quietly to yourself about the steps that could be part of planning the action your team picked.

2. Write, draw, or use another way to record your ideas on small pieces of paper. Each piece of paper should have one step.

   a. Remember the *Communication Strategies* you learned about Task 2. Do you need to include any of those strategies as steps?

   b. Remember the shareholders you thought about in Task 5. Are there any steps you need to add to include them?

   c. Remember the other groups you could partner with from Task 6. Should any of them be included in this action plan?

3. Have each team member share their steps by placing their pieces of paper on a table or by using a digital tool for collaboration.

4. Read through the steps from your teammates.

   a. Did you notice any steps that were similar to yours?

   b. Do you think your team is missing any steps?

5. Start to organize your team's steps. You can move the pieces of paper around as you do this. Thinking about your team's steps will help you decide how you will take action.

   a. Group any similar steps together.

   b. Remove any steps that you don't think are needed to help your team take action.

   c. Think about how each team member will help. Put their names with the steps they would like to help with.

   d. Think about what steps might be missing. Add those steps.

6. Put the steps in order. For example, what do you think the team needs to do first? Place that piece of paper before all the others.

7. Title a sheet of paper "Action Plan" and record the following:

   a. The steps your team would like to take.

   b. The order of those steps.

   c. Who will help with each step (it might be more than one person).

   d. When and where you will take these steps.

   e. Partners or other shareholders you will involve.

   f. How you will communicate your action plan to the community .

8. Think about what you will do if your plan doesn't work or you run into another problem. For example, what will you do if an adult in your community says you need permission to do something. Record these ideas as part of your action plan.

9. Remember to create an **inclusive** action plan. Being inclusive means everyone on your team can participate in some way. You may need to make changes to the plan so that everyone feels safe, comfortable, and able to help. Those changes are okay! They are part of being a good teammate and focusing on justice.

Remember you are not alone in this. That's the one thing that gets me going. My anxiety is strongest when I feel like no one else sees the dangers of the world we live in today. My anxiety comes from not just the extreme weather events, but knowing that this is being permitted and there are world leaders who are not doing anything or who are even blocking action. And that is so overwhelming and so scary. But then you remember that there are so many people experiencing the same thing and fighting back alongside you. And you might not see them, you might not know them yet, but it literally is a global youth movement and there is someone in every country fighting for the same thing you are. And when you think of it at that scale, you think, wow, there are so many of us! How could we fail?

—Mitzi Jonelle Tan

Act: *How have we changed?*

The time has come to act! You can use everything you have learned to take the first step toward making your community more environmentally just.

1. With your teammates, implement your *Action Plan*. This may take some time. There is no need to worry; take the time you need. When you are finished, come back and complete this activity.

2. Think quietly about the action you took. Consider:
    a. What went well?
    b. What do you think could have gone better?
    c. How would you change your action if you had to do it again?
3. Discuss with your team:
    a. What makes you proud of yourselves as a team?
    b. What do you think you have learned for next time?
    c. Do you think it is possible for the world to become more environmentally just?
4. Examine your definition of environmental justice from Task 2. Have your ideas changed? If so, write down those changes on your _Justice Reflection_ sheet.
5. If you had to share your story to inspire someone who is just learning about environmental justice, what would you say? If you want, you can share your story with us at #SmithsonianScienceEJ.

> _We shall overcome because the arc of the moral universe is long but it bends toward justice._
>
> —Dr. Martin Luther King Jr.

Find Out More!

For additional resources and activities, please visit the _Environmental Justice!_ StoryMap at https://bit.ly/3tM4bVE.

Glossary

This glossary can help you understand words you may not know. You can add drawings, your own definitions, or anything else that will help. Add other words to the glossary if you would like.

Action researchers: People who use their own knowledge and information they find out from their community to make decisions and take action on important issues

Advocate: Recommend or support

Air toxics: Hazardous chemicals released into the air, usually from industrial processes

Access: Able to easily reach

BIPOC: Black, Indigenous, People of Color

Case study: Using a specific example to understand a broader situation or process

Causation: When one thing causes another

Collective effort: An action that many people take by working together

Colonialism: When one country or group tries to control another place or people either by physically occupying the place or by using force, money, or power

Community: A group of people who have something in common, such as sharing the same local area

Consensus: A balanced decision that works for everyone in the group

Data: Pieces of factual information

Decibels: A measurement of how loud a sound is

Defy: Resist or refuse to obey something or someone

Despairing: Losing hope

Disability-Adjusted Life Years: A health statistic measuring the loss of one year at full health for a person

Discrimination: When one group is treated unequally compared to another group

Economic: About money, income, and use of wealth

Ecosystems: Communities made of living things and nonliving things

Environment: The conditions and things around us

Environmental: About the natural world

Environmental Justice: Fair access to a healthy environment

Ethical: The fairness of something

Exposure: In contact with something

Extreme heat: When a place gets so hot that it can start to affect the health of people living there

Groundwater: Water that stays underground in the soil or spaces between rocks

Health statistics: Numbers used to understand how healthy a group of people are

Heat islands: Places in cities where heat gets trapped

Inclusive: Making sure no one is left out

Indigenous: A group of people or other living things that are native to a place and have not migrated from elsewhere

Inevitable: Sure to happen

Injustice: A situations that is not just

Innovations: New ideas or methods of doing something

Intersect: Ways things, ideas, and identities can meet and overlap

Life expectancy: The average of how long people live

Micrometer: One millionth of a meter

Microplastic: Very small pieces of plastic pollution

Noise pollution: Levels of noise that are harmful or annoying

Particulate matter: Small airborne particles, such as pollen, dust, or smoke

Perspectives: The way we think about the world around us

Policies: Government actions or rules

Pollutants: Substances that pollute something, such as air or water

Population: A group of people with something in common, such as the place they live

Redlining: A discriminatory practice in the United States in which banks and other organizations restricted financial services, such as mortgage lending, to people living in neighborhoods where the community was mostly people of color

Shareholders: People who share a problem and should be involved in finding a solution

Social: About the interaction of people in a community

Social norms: Ideas or ways of behaving that are generally acceptable in a place

Stewardship: Caring for the environment

Surroundings: The places and things around us

Survey: A list of questions that you can give to a group of people

Sustainable: A balanced, long-term approach to social, environmental, economic, and ethical concerns

Sustainable Development Goals: Global goals set in 2015 to address the most important global problems to work on until 2030

Systemic: Related to a whole system

Systemic cause: A cause related to a whole system, such as an economic or governmental system

Transformative: Causing a dramatic change

Radical: Causing a significant change

United Nations: An international organization that represents almost all the countries in the world

Other words:

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Figure 9 – United Nations
Figure 10 – Smithsonian Science Education Center
Figure 11 – Smithsonian Science Education Center
Figure 12 – Smithsonian Science Education Center
Figure 13 – United Nations
Figure 14 – Smithsonian Science Education Center
Figure 15 – Smithsonian Science Education Center
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Figure 20 – Smithsonian Science Education Center
Figure 21 – Map data: Google, Imagery@2022CNES/Airbus, Maxar Technologies
Figure 22 – SDI Productions/E+/Getty Images Plus
Figure 23 – Library of Congress, Prints & Photographs Division [LC-DIG-ppmsca-37853]
Figure 24 – National Parks Service, Bob Fitch Photography Archive, Department of Special Collections, Stanford University Libraries
Figure 25 – United States Environmental Protection Agency
Figure 26 – United States National Parks Service
Figure 27 – Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income, 59 FR 7629; February 16, 1994, pp. 1, National Archives of the United States
Figure 28 – United States Department of the Interior

Acknowledgments

Project Advisors

Highly Able Children Program
Agastya International Foundation
Bangalore, India

Jennifer Brundage
National Outreach Manager,
Smithsonian Affiliations
Washington, D.C., USA

Kālewa Correa, MLIS, MEd
Curator of Hawai'i and the Pacific,
Smithsonian Institution, Asian Pacific
American Center
Waimea, HI

Brian Coyle, PhD
Program Manager, Smithsonian Institution,
National Zoological Park & Conservation
Biology Institute
Washington, D.C., USA

Amarjargal Dagvadorj MD
Health advisor, Breathe Mongolia-Clean Air
Coalition NPO, US
Officer, Parliamentary Research Service
Ulaanbaatar, Mongolia

Ervis Foundation Youth Group
India, USA, and Dubai

Yadu Chengarapallil Joyothikumar
Program Consultant, Agastya International
Foundation
Bangalore, India

Margad Khashbat
Content Contributor at Breathe Mongolia
Ulaanbaatar, Mongolia

Sophia Kianni
Founder and Executive Director,
Climate Cardinals, United Nations
Youth Ambassador on Climate Change
Washington, D.C., USA

David Killilea
Esmerelda Pérez
Isabel Waters
Irish Doctors for the Environment
Dublin, Ireland

Gabrielle Lee
Cultural Interpreter, National Museum
of the American Indian, Smithsonian Institution
Washington, D.C., USA

Dr. Sadhbh Lee, MB BCh BAO MRCPI
Obstetrics and Gynecology Registrar
Co-founder of Irish Doctors for the Environment
Dublin, Ireland

Taylor Morton
Director of Environmental Health and Education,
WE ACT for Environmental Justice
New York, NY, USA

Andrea Kim Neighbors
Manager, Education Initiatives, Smithsonian Asian
Pacific American Center
Washington, D.C., USA

Onyemaechi Nweke, DrPH, MPH
Science Advisor, Office of Environmental Justice,
US Environmental Protection Agency
Washington, D.C., USA

Katherine Ott, PhD
Curator in the Division of Science and Medicine at the
Smithsonian National Museum of American History
Washington, D.C., USA

Margot Parkes, MBChB, MAS, PhD
Professor, School of Health Sciences, University of
Northern British Columbia
Prince George, British Columbia, Canada

Priyanka Prakash
Program Director
Ervis Foundation
Pune, India

Orlando R. Serrano, Jr., PhD
Manager, Youth and Teacher Programs, Smithsonian
National Museum of American History
Washington, D.C., USA

Danielle Simms
Former National Advocacy Director,
WE ACT for Environmental Justice
New York, NY, USA

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Technical Reviewers

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