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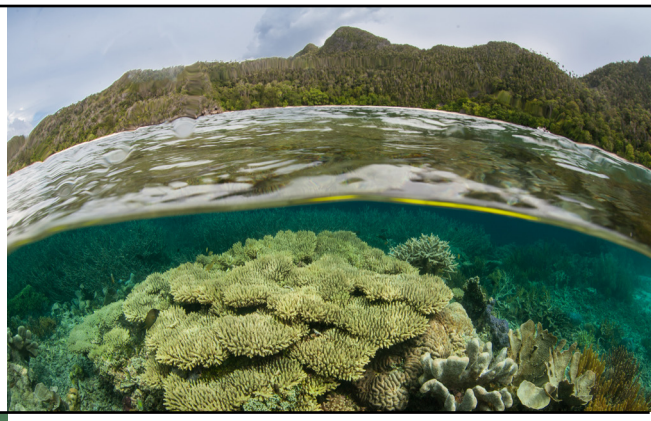

Part 3:

How can I balance the needs of people and other living things in my community?

SUSTAINABLE DEVELOPMENT GOALS

developed by

Smithsonian
Science Education Center

in collaboration with

iap SCIENCE HEALTH POLICY
the interacademy partnership

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Figure 3.1: Ximena Velez-Zuazo headshot: Ricardo Stanoss/NZP-SCBI
Reynaldo Linares-Palomino headshot: Ricardo Stanoss/NZP-SCBI
Figure 3.1: Ximena Velez-Zuazo
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Figure 3.6: Reynaldo Linares-Palomino
Figure 3.7: Reynaldo Linares-Palomino
Figure 3.8: Sebastian Lozano, SCBI/CCS-BMAP
Figure 3.9: Brian Griffiths: ACEER, OnePlanet

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PART 3: HOW CAN I BALANCE THE NEEDS OF PEOPLE AND OTHER LIVING THINGS IN MY COMMUNITY?

Find out More!

For additional resources and activities, please visit the *Biodiversity!* StoryMap at https://bit.ly/3zvJ2Qh.

Planner

Timing note: *The time used 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 living things are in our research area?					
Discover	Consider the living things in your community and the senses you use to observe them.	• Paper • Pens or pencils • Computer (optional)	*Living Things Identity Map* (Part 1, Task 2)	20 minutes	112
Understand	Use tools to investigate what living things are in your research area.	• Paper • Pens or pencils • Computer (optional)	*My Research Area map* (Part 1, Task 4)	20 minutes + investigation time	115
Act	Classify living things in your research area.	• Paper • Pens or pencils • Computer (optional)		30 minutes	119
Task 2: What do the living things in our research area need to survive?					
Discover	Discuss with your team what the living things in your research area might need to survive	• Paper • Pens or pencils	*Part 3 Organizer* (Part 3, Task 1)	15 minutes	123
Understand	Investigate the different needs of the living things in your research area.	• Paper • Pens or pencils • 3 plants • Soil • 3 plastic cups • Water	*Part 3 Organizer* (Part 3, Task 1) *Oral History Instructions* (Part 2, Task 2), optional	45 minutes	124
Act	Share the different needs of living things in your community and decide how well your community is meeting those needs.	• Paper • Pens or pencils	*Part 3 Organizer* (Task 1) *Part 2 Organizer* (Part 2, Task 2) *Balanced Community Goals* (Part 1, Task 3)	25 minutes	127

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Task 3: What do the people in our community need to survive?					
Discover	Identify what you need and how you meet those needs.	• Paper • Pens or pencils		20 minutes	129
Understand	Investigate the needs and wants of the people living in your community.	• Paper • Pens or pencils • Photos of research area (optional, Investigation D)	*Survey Instructions* (Part 2, Task 2), optional *My Research Area map* (Part 1, Task 4), optional	30 minutes + investigation time	130
Act	Share your communities needs and wants.	• Paper • Pencils	*Part 3 Organizer* (Task 1) *Balanced Community Goals* (Part 1, Task 3)	25 minutes	132
Task 4: What are the conflicts between people and other living things in my community?					
Discover	Examine conflicts from various perspectives.	• Paper • Pens or pencils • Computer (optional)		25 minutes	134
Understand	Explore a case study about conflict between people and living things.	• Paper • Pens or pencils		30 minutes	136
Act	Identify some conflicts between people and other living things in your community.	• Paper • Pencils	*Part 3 Organizer* (Task 1)	30 minutes	140

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
Task 5: How can I take action to balance needs in my community?					
Discover	Consider what you now know, think, and wonder about conflicts in your community.	• Paper • Pens or pencils	*Part 3 Organizer* (Task 1) *Balanced Community Goals* (Part 1, Task 3)	15 minutes	143
Understand	Decide on individual actions you will take to help your community.		*Part 3 Organizer* (Task 1)	15 minutes	144
Act	Put your idea for individual change into action and reflect on it.			10 minutes + action time	146

*StoryMap extension found at https://bit.ly/3zvJ2Qh

Part 3. How can I balance the needs of people and other living things in my community?

In Parts 1 and 2 your team gathered information about the living things in your community. You started to think about your goals for a balanced community. In this Part your team will collect even more information about the people and other living things in your research area. You will find out more about the **biodiversity**, or the different types of living things, in your research area. You will also investigate what the living things and people in your research area need to live. You will learn how scientists try to balance the needs of people and other living things. This will help your team take action to balance the needs of people and other living things in your community in Part 7.

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.*

Your Research Mentors

Sharing your experiences with others and learning from others' experiences is part of being a good action researcher. In Part 3 you will have two research mentors. A mentor is someone who has experience and can help guide you. The research mentors in this Part will help you understand some of the issues related to biodiversity and how you can investigate and take action on those issues.

Meet Ximena and Reynaldo, Your Part 3 Research Mentors

This is Dr. Ximena Velez-Zuazo. Ximena (Hee-MEN-ah) is a scientist who works for the Smithsonian Institution. Ximena leads a research team in Peru. Ximena's research area includes a **breakwater**. A breakwater is a large structure that protects a port from waves and storms and allows ships to safely approach. It is built by humans. Ximena works near a breakwater at the end of a

pipeline. A pipeline is a structure that moves gas or liquid from one place to another. It is also built by humans.

Building a breakwater can disturb living things. It can also attract living things to live in that area. Ximena's job is to figure out what things are living at the breakwater. She collects data to figure out if the biodiversity in her research area changes because of the breakwater.

This is Dr. Reynaldo Linares-Palomino. Reynaldo (Ray-NALL-doh) also works for the Smithsonian Institution and leads a research team in Peru. His research area includes the same pipeline that Ximena works near. But Reynaldo's team works on the part of the pipeline that is on land.

Reynaldo's job is to figure out what things are living near the pipeline. He also collects data to figure out if the biodiversity in his research area changes because of the pipeline.

Ximena and Reynaldo have knowledge and perspectives that came from their identities. Since Ximena and Reynaldo are now working with you, it is important to understand who they are.

To help you, Ximena and Reynaldo filled out an identity map, just like you did in Part 1. Ximena's identity map includes the following things:

Ximena included the following things in her identity map:

- I am 47 years old
- I am female
- I am Latin, Amerindian, European, and Chinese
- I live in Lima, Peru
- I have brown hair, brown eyes, wear glasses, and have tan skin
- I am funny in my own language, positive, optimistic
- I am the middle sibling
- I love arts and crafts, sports, and the ocean
- I am part of groups for women in science, technology, engineering, and math (STEM), and women who code

Reynaldo included the following things in his identity map:

- I am 49 years old
- I am male
- I am Latino
- I live in Lima, Peru
- I am from Peru but lived almost a third of my life in Germany
- Cuzco and Tarapoto are important cities for my family
- I have long black hair and glasses
- I am "pensativo" (thoughtful), quiet, and calm but with a big laugh
- I am a dad to a 14-year-old and a 5-year-old
- I love hearing and making music, and reading about the history of science
- I love being outdoors, hiking, running, and reading

Before you begin the rest of Part 3, think quietly to yourself about Ximena and Reynaldo's identity maps.

- Are there things you have in common with Ximena and Reynaldo?
- Are there ways in which you are different from Ximena and Reynaldo?
- Can you see anything about Ximena and Reynaldo's identities that would help them understand how to balance the needs of people with the needs of living things?

Task 1: What living things are in our research area?

Your team is trying to achieve the goal of a balanced community. In other words, you are trying to meet the needs of the people living in your community while also meeting the needs of other living things. For example, people need space to live. But so do the plants, animals, fungi, and bacteria in your community. To figure out the best way to share that space, you need to know which plants, animals, fungi, and bacteria are living in your research area.

In this task you will explore what else is living in your research area besides people. You will ***discover*** how to use your senses and other tools to help you find living things. You will plan an investigation to ***understand*** what living things are in your research area. Then you will ***act*** to **classify** and record these living things.

Discover: *What living things did we discover already?*

In Part 1 your team started exploring what living things are in your community. You made a map of some of the living things in your community. Now your team will find even more living things in your research area. You will learn from other scientists how to use your senses and other tools to do this.

1. Take out your *Living Things Identity Map* from Part 1, Task 2, Act.
2. Consider the map with your team. Discuss what kinds of living things your team observed most often. Did you notice more animals, plants, fungi, or bacteria? Remember that it's okay if you didn't notice bacteria. They are very small and you can't easily observe them.
3. You may have noticed that your team observed one kind of living thing more often than the others. Remember this when you are planning your investigation in the Understand activity. Try to search for the living things that your team didn't notice as often in Part 1.
4. Consider *Living Things Identity Map* from Part 1 again. Discuss how your team completed that activity. How did each person use their senses to observe the living things in your community?
    a. Remember that you did not use your sense of taste because that sense is unsafe in this kind of scientific investigation.

5. Work as a team to record your answers. Record them in whatever way works best for your team, such as a list, drawing, video, or some other way. However you record it, leave some extra space because your team will add to this as you learn more in the next few steps.
6. In the next activity your team will use your senses and other tools to find living things in your research area. Learn how Ximena and Reynaldo use their senses to find living things. You will also learn how they use tools, such as cameras, to help them make their observations.

Ximena says…

I use my sense of hearing underwater. I hear whales, dolphins, fishes, and other living things in the ocean that make noise. I use my sense of sight to identify and locate fish underwater. I use my sense of touch, although never to touch corals! I use my sense of touch to handle fishes, sea turtles, or sharks. Out of the water I use smell, definitely with seabirds and their guano.

The tools we use include drones underwater and flying drones above water. We use camera traps and webcams, machines that record sound underwater, GoPro cameras, microscopes, rulers, and scales.

Figure 3.1: Ximena also uses a wetsuit, mask, and fins to help her swim around and find living things underwater.

Reynaldo says:

I use my vision to look at different forms and colors. I also use touch to see if a leaf or bark is leathery, rough, or soft, because those differences allow me to classify the different kinds of plants. Smell helps. For example, when I slash the bark, does the sap that comes out smell sweet or bitter? And when I'm in the middle of the jungle and there are lots of potentially dangerous animals, you have to be aware of noises as well, like bees and wasps and snakes.

One of the main tools I use is a handheld magnifying lens. Sometimes you need to look at really small parts of flowers or leaves, and they are not easy to see, especially for me, who uses glasses! We usually have magnifying glasses around our necks and carry them everywhere. We use measuring tapes, too. We used to use heavy and expensive cameras but now you can get a clear picture with a simple cell phone, so we take cell phones with us. You don't need expensive equipment.

Figure 3.2: Reynaldo collects data about organisms in the desert of Peru.

7. Think about how Ximena and Reynaldo use their senses and other tools to find the living things in their research area. Take out the record you made in step 5 and discuss the following questions as a team:

a. Could you use any of the same senses or tools that Ximena, Reynaldo, and their teams used?
b. What other senses or tools do you want to use?

8. Add any useful suggestions from Ximena and Reynaldo to your record.
9. This record will help you plan an investigation in the next activity. Your team will use your senses and other tools to find the living things in your research area.

Understand: *How can we investigate our research area?*

In the Discover activity you thought about how you can use your senses or other tools to find living things in your research area. Now your team will use this information to plan an investigation. Don't worry about trying to find all of the living things in your research area in this activity. Just do the best you can. If your team completes Parts 4, 5, and 6 you will have more chances to find living things.

1. Gather your team and take out the *My Research Area* map you made in Part 1, Task 4, Act. Recall where your research area is.
2. Your team will observe the living things in your research area.
3. Read *Investigation Instructions* for more information about how to observe living things in your research area.

Investigation Instructions

Where to investigate:

a. It can feel overwhelming to explore your entire research area. But you do not have to explore your entire research area all at once! Start with just one space. For example, you might only observe the space right outside of your home or school.
b. Some scientists observe a very small section of their research area at a time. For example, the Biocube activity from the Smithsonian National Museum of Natural History describes how you can use a 1-meter cube to explore your research area. This allows you to explore a small area very thoroughly before moving on. More information about the Biocube activity is in the *Biodiversity!* StoryMap.

c. Pick a space that you can safely and comfortably go back to. You may need to observe that space more than once to find living things.

Tools you can use:

a. You can use your senses. Consider what you recorded in the Discover activity about how your team, Ximena, and Reynaldo all use their senses to find living things. Make this a part of your plan. Remember to never use your sense of taste. Read the Physical Safety Tips at the bottom of this box for more information on using your senses safely.

> **⚠ Emotional Safety Tip**
>
> Remember to be an inclusive team member. Every person on your team brings different skills and perspectives. Some members of your team may not want to or be able to use all of their senses. That is fine. Talk to your teammates and find a way for everyone to participate and feel comfortable.

b. A magnifying glass can help you look closely at living things or find very small living things.
c. A camera can help you record the living things you find so you can observe more closely later. You can also use photos to share what you find with your teammates or other scientists.
d. Paper and a writing tool can help you record a description or draw the living things that you find.

Tips for doing this investigation:

a. Record when you find a living thing. You could make a list, draw a picture, say it into an audio recorder, or use another way.
b. If you find the same kind of living thing more than once you should write that down. For example, if you find four pine trees in the space outside of your home, record "four" next to where you recorded "pine trees."
c. Try moving through your area in a pattern. For example, start by searching for living things high up, then at the level of your head, then down by the

ground. Or place a string or rope in a straight line through your research area and observe things only within 1 meter of that line.

d. It can be easier to find living things on land. But remember to also search for living things in water, such as puddles, streams, ponds, or the ocean. Consider using a container to collect some water so you can closely observe the living things.
e. Remember to search for living things in the air. You can also search for living things in high places. If you are able, a tool like a pair of binoculars can help you observe living things in the air or high places such as tall trees.
f. Observe living things at different times of day or the year. For example, try observing your research area at dawn, dusk, or at night. Some living things only come out at those times. Remember to get permission from an adult to observe living things at night to make sure it is safe to do so. If you use a light to search for animals be careful not to shine it directly at them. You can also observe livings during different seasons. For example, some living things may only be visible during the wet season.
g. Explore in, around, and under any human-made structures or objects. Some living things use human-made spaces as habitat. For example, sometimes birds build their nests in buildings or plants grow in the cracks in pavement.

Figure 3.3: Search for living things everywhere. They may be growing in places you wouldn't expect. This plant is growing underneath a highway in an area of rock and concrete.

h. Be quiet as you observe. Loud noises may scare away animals.
i. Consider staying in one part of your research area for several minutes to allow living things to return to the area after being disturbed. Notice what you observe after 1 minute, 5 minutes, and 15 minutes. This can be a good time to just listen for living things if that sense is available to you.
j. Try not to disturb the living things as you explore your research area. If you pick something up or take it with you, try to return it to exactly where you found it.
k. Observe animals that are wild. Do not observe animals that are being cared for by people. For example, do not observe pets, animals in zoos or aquariums, or animals that are on farms.

Safety Tips for Observing Outside:

Talk to your teacher first for guidelines. They will know what is safest in your community.

⚠ Physical Safety Tip

Do not observe a research area by yourself. Always work with at least one other person, which could be an adult or a teammate. Be a good ally to your teammates and notice if they are uncomfortable or unsafe. Offer to pause the investigation or move to another part of the research area. Always pay attention to local guidance on whether it is safe to interact with people outside of your home.

Do not use your sense of taste to try to observe living things. Do not touch living things that you are unsure are safe to touch. For example, some plants and fungi can irritate your skin and some animals may bite or sting.

⚠ Emotional Safety Tip

Do not be discouraged if it is difficult to find living things. Every research area is different. Some areas may have many living things and some may have very few. It is not your fault if you have trouble finding living things. Just practice using your senses and other tools to do your investigation. If you feel sad or wish there were more living things in your research area, remember that you will take action to make this possible!

4. If finding living things outside doesn't sound like the right investigation for your team, that's okay! You can pick another way to collect information about your research area.
    a. You can use online tools, such as iNaturalist, to find out what living things have already been found in your research area. More information about iNaturalist is in the *Biodiversity!* StoryMap.
    b. You can use books, lists, websites, videos, artwork, photos, stories, or other records of your research area and notice the different kinds of living things they show. Try to use records that have been made recently to make sure you are only observing living things that still live in your research area.
    c. You can write, call, or talk to local scientists, researchers, older people who have lived in the community a long time, gardeners, or other experts on living things in your research area. Ask them to describe what living things they have observed in your research area.
5. Decide as a team how you will investigate.
6. Remember, including everyone on your team is important. Try to pick a way to investigate that allows everyone to participate. Don't forget to think about the timing, comfort, location, and format of your investigation to make sure everyone on the team feels included. You can reread Part 2, Task 2, Understand if you need more information about making your investigation inclusive.
7. Next, work with your team to plan how you will do your investigation. For example, if you decide to do an observation, decide which teammates will observe which parts of the research area. Decide how long you will spend finding living things. Decide how you will record the living things you find and who will do the recording.
8. Finally, do your investigation with your team.

Act: *How can we classify the living things in our research area?*

Your team has just completed a very important step in helping to balance the needs of people and other living things in your community. You have observed the kinds of living things in your research area. Now you will classify these living things. This information will help you complete the rest of this Part and to take action in Part 7 to create a balanced community.

1. Your team is going to classify the living things you just found in your research area. Classify means to name or identify something and to sort it into a group. Classifying living things can help you understand more about the biodiversity in your research area. Remember that biodiversity is a measurement of how many different living things are in an area. To measure biodiversity in your research area, you need to know how many different kinds of living things you observed.
2. Read Tools to Help Classify Living Things for more information about how to classify living things in your research area.

Tools to Help Classify Living Things

1. A field guide is a tool that has the names, images, and descriptions of living things in an area. Field guides may be printed (such as books) or online.
2. If you do not have a field guide, your team can come up with your own names for living things in your research area. Read *How to Classify Living Things* for more information.
3. You can use an online tool such as the iNaturalist website, which is also known as a community science tool. People in a community take photos or describe what living things they have noticed in their area. They send the photos and descriptions to scientists through the website. The scientists help identify what the living things are. This helps scientists and community members keep a record of what kinds of living things are in an area. More information for iNaturalist is in the *Biodiversity!* StoryMap**.**
4. Communicate with a person who is respected in your community because of their knowledge of the environment and living things. This might be someone who has lived in the community for a long time, someone with traditional knowledge, or someone who gardens.
5. If you don't have access to any tools to help you classify, just try to notice if the living things you observed are different from each other. For example, maybe you observed a plant in your research area that had small, spiky leaves and another plant that had large, flat leaves. Even though you don't know the names of the plants, you can tell that they are not the same. Record that you observed two different plants in your research area.

3. Read *How to Classify Living Things*. It explains that there are many ways to classify a living thing. No matter which way you choose to classify the living things in your area, remember that your way is valuable because it came from you.

How to Classify Living Things

You can use a field guide to help you find out the names of living things in your area. The field guide may use scientific names. Scientific names are two-part names that some people in the scientific community use to identify living things. For example, the scientific name for a puma is *Puma concolor*.

But a scientific name is not the "right" or only way to identify living things in your research area. You may already have a name for living things in your own language or in your own community. For example, the scientific name of the bird in Figure 3.3 is *Paroaria gularis*. This bird is called a red-capped cardinal in English. But in the Ese'Eja language this bird is called chaji'i'i or enaena. There are many different names for the living things on Earth. Search for the name that works best for you or create your own.

If you can't find or think of a name, you can also identify a living thing based on what you observe about it. You could identify it based on what it means to people in your community. Or you could identify it based on something that living thing does or represents. For example, if the Ese'Eja hear the chagi'i'i bird singing it means it is about to rain. What do some of the living things in your community mean to you? Do you notice them at particular times of year or day?

Figure 3.4: A chaji'i'i or enaena.

4. Work with your team. Title a sheet of paper or a digital document *Part 3 Organizer*. Make three columns just like you did for your *Part 2 Organizer*. Write the words "Know," "Think," and "Wonder" at the top of the columns.
5. Create a list in the *Know* column of the living things that your team found in the research area.
    a. Record the name of each living thing you found. If you were not able to find or create a name you can write a description, use a symbol, or make a drawing.
    b. Record whether the living thing you found was a fungus, plant, bacterium, or animal.
    c. List how many of that living thing you found.
    d. If several team members found the same living thing, combine those numbers and record the total. For example, if one person found four pine trees in their part of the research area and another person found five pine trees in their part of the research area, record "nine pine trees."
6. Discuss the following questions as a team:
    a. Consider your *Know* column. Did your research area have many different kinds of living things? Or did it have the same kind of living thing over and over?
    b. Were there any living things that you found more than once? For example, did you find a type of fungus more than once?
7. Answer the following questions in the *Think* column:
    a. What does your team think or feel about the biodiversity in your research area?
8. Answer the following questions in the *Wonder* column:
    a. What other kinds of living things do you think might live in your research area?
    b. Do you wish your research area had more kinds of living things?
9. Keep the *Part 3 Organizer* in a safe place.

Task 2: What do the living things in our research area need to survive?

In this task your team will explore what the living things in your research area need to survive. You will ***discover*** what you already know about the needs of living things. Then you will use an investigation to ***understand*** what the living things in your research area need. Finally, you will ***act*** on this information to decide how well your community is meeting those needs.

Discover: *What do we already know about what living things need?*

In the Part 1, Task 1, Understand activity you observed a living thing in the community and thought about what it might need to survive. Now you will work with your team to discuss what living things in your research area might need to survive. This will help prepare you for the investigation in the Understand activity.

1. Take out your *Part 3 Organizer*.
2. Consider the list of living things in the *Know* column.
3. Choose a living thing that you observed and think about these questions on your own:
    a. What do you think that living thing needs to survive?
    b. What did you notice about where you found this living thing? For example, was it near water? Did you notice it eating anything near it? Was it in a sunny place?
4. Gather as a team and have the team leader share what they think their living thing needs. For example, if they observed a mushroom and they think it needs a wet, soggy place to grow they would write that next to "mushroom" in the *Know* column.
5. Share what you think your living thing needs. Either you or the team leader can record your answer in the *Know* column.
6. Record the answer of everyone else on the team. Remember that your teammates are just sharing their thoughts and guesses. Do not worry about being right. Your team will have a chance to find out more in the Understand activity and add to your answers in the Act activity.

Understand: *How can we investigate what living things need to survive?*

Living things need certain things to survive. For example, humans and many other kinds of animals need oxygen to survive. Every time you breathe in and out you are meeting your needs.

Many living things share a need for water, space, and a source of energy. But each living thing on Earth is different. Some plants can survive for a long time without water. Bacteria only need a very small space to live in, while a fungus may spread out for hundreds of meters underground. Plants can make their own energy using sunlight, carbon dioxide, and water, while an animal has to eat other living things to survive. In this activity your team will investigate the different needs of the living things in your research area.

1. Gather your team together and take out your *Part 3 Organizer*.
2. Read through the list of living things in the *Know* column. Remind yourself of what is living in your research area. Remember that your team thought about what these living things might need in the Discover activity. Now you will need to work as a team to find out what these living things actually need to survive.
3. Discuss how you will investigate the needs of the living things in your research area. Remember that in general, living things need water, space, and a source of energy. Each living thing needs different amounts and may meet its needs from different sources. For example, a small plant living in cracks in the pavement might only need a little bit of space for its roots. But a pine tree may need several meters of space for its roots.
4. There are many ways to investigate. You could:
    a. Plan another observation like you did in Task 1. You could observe each living thing outdoors and notice how it is meeting its needs for water, space, and a source of energy. Be aware that some needs may be more difficult to observe than others. It can be hard to notice what an animal needs to eat if it isn't eating when you observe it.
    b. Interview an expert in your community on the phone, online, or in person. An interview is similar to the oral history you collected in Part 2, Task 2, Understand. But instead of asking about the past you will ask people about

what they know now. Go back to Part 2, Task 2, Understand if you need help with this kind of investigation. You could interview:

i. Older people who have lived in the community a long time and know about the living things in it
ii. A person who is respected in your community because of their knowledge of the environment and living things
iii. Someone with traditional knowledge of living things
iv. A scientist that studies living things
v. A gardener, landscaper, or tree surgeon
vi. A volunteer at a local nature preserve or wildlife refuge
vii. A farmer or another person who works with crops
viii. A person who works or volunteers with living things

c. Use books, websites, videos, artwork, audio recordings, or other records of what the living things in your research area need. Try to use records that have been made recently to make sure you are only learning about the living things that still live in your research area.
d. Do an experiment like the one in *Experiment: Plant Needs* to observe what certain living things need to survive.

Experiment: Plant Needs

You can use plants to demonstrate the needs of living things. Note: It is not ethical to use animals in this kind of experiment.

1. Get three plants. The plants should be exactly the same kind.
2. It is best to grow, borrow, or purchase plants in containers. It makes it easier to move them to do the experiment. Do not use expensive or precious plants. Use plants that an adult says it is okay to experiment with.
3. Place one plant in a dark space with no light. Continue to give it water as normal.
4. Place one plant in a space with plenty of light. Sunlight is best but light from a lamp can also work. Do not water it.

5. Place one plant in a space with plenty of light. Continue to give it water as normal.
6. Observe each plant every few days.
7. Record how the plants change over time. It may take several days or weeks to notice a change.
8. Which plants seem unhealthy over time? What does this tell you about what plants need to survive?

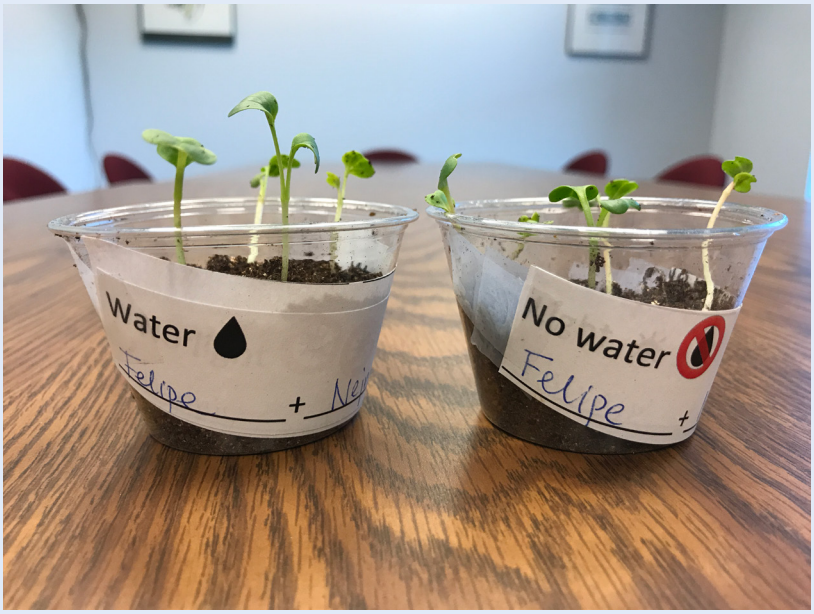

Figure 3.5: This is one way label the plants in your experiment.

e. Think of your own way to collect information.

5. It might be difficult to get all of the information you need from just one kind of investigation. You may need to combine more than one kind.
6. Decide what kind of information you want from this investigation.
   a. Remember that living things have three basic needs: water, space, and a source of energy. You will need to find out how the living things in your research area are meeting these needs.
   b. In the next activity you will start to think about how your community is meeting the needs of living things. So try to notice or ask if some of the living things in your research area are having trouble meeting their needs. For example, you may observe that some plants don't seem to have enough

room to grow. Or you may learn in an interview that there are fewer frogs in your community than there used to be because the pond has been drained to make space for a building.

7. Plan your investigation. Decide what needs to be done and who will do each part. You can:
   a. Split up the list of living things from the *Know* column among your team members. One way is to assign some people to investigate animals, some people to investigate plants, and some people to investigate fungi and bacteria.
   b. Decide how you want to record the information from your investigations. You can write it down, draw pictures, record your voice, or find another way.
   c. Decide who will lead the investigation and who will record the information from those investigations.
8. Work with your team to do your investigation.

Act: *How can our community meet the needs of living things?*

Your team has investigated the needs of the different living things in your research area. Now, your team will share what you observed and use that information to decide how well your community is meeting those needs.

1. Take out the information you recorded from the Understand activity.
2. Take out your *Part 3 Organizer*.
3. Remember that your team recorded what they think some of those living things need in the *Know* column. Now you will have a chance to add to or change your answers.
4. Have the team leader record what they found out in the Understand activity. They should put their answers in the *Know* column. For example, the team leader may have learned from an interview with a scientist that the eagles in the research area need a safe, high space to build a nest and raise chicks. Eagles meet this need by building nests in places like tall trees or human-built towers.
5. Let the team leader know if they describe a need that you also found in the investigation. For example, if you found out that squirrels need space to build

nests and also use tall trees. Circle that need or make some other mark next to it. This will help you record that this is something that more than one living thing needs or wants.

6. Next, share any needs you learned about in the investigation that haven't already been listed. Have the team leader record your observations or add them yourself if you are working with a digital or shared document.
7. You should now have a list of what the living things in your research area need.
8. Discuss what you learned about in the investigation as a team.
    a. What needs are shared by many different kinds of living things in your research area?
    b. Are any living things in the research area struggling to meet their needs?
9. Take out your *Part 2 Organizer* or the information from your investigation in Part 2, Task 2, Act. Remember that you investigated how your community changed over time. Information from this investigation can help your team discuss how well your community is meeting the needs of living things. Discuss:
    a. In the past did your community have a resource that helped meet the needs of living things, such as an area with trees that provided habitat for animals?
    b. What happened to that resource?
    c. Why did it change over time?
10. Take out your *Balanced Community Goals.* Review them with your team. Discuss the following questions:
    a. How well do you think your community is meeting the needs of the living things in your research area?
    b. Do you think it is important to meet the needs of living things other than people? Why or why not?
    c. Are there goals in the *Balanced Community Goals* that would help your community meet the needs of living things? If not, think about adding those goals now.

Task 3: What do the people in our community need to survive?

Your team has found out information about the needs of living things in your research area. Now, you will ***discover*** what you need from your community. You will use an investigation to ***understand*** what other people need from their community. You will ***act*** on this information to decide how well your community is meeting those needs.

Discover: *What do I need to survive?*

Your team is trying to create a balanced community. This means that you need to balance the needs of all living things including people in your community. You have already investigated what the other living things in your research area need to survive. Now your team needs to find out what people in your community need. Your team members are an important part of this community. So any research into what people in your community need should start with you.

> **⚠ Emotional Safety Tip**
>
> It can be hard to think about what you need, especially if you feel like you or your caregivers aren't able to meet all of your needs. It is not your fault if you can't meet your needs and everyone deserves to have their needs met. It is okay to skip some of the questions in this activity or keep your thoughts to yourself. You don't have to share anything from your personal life with your team if you don't want to. If you feel you need to discuss this more, you can talk to your teacher or another trusted adult.

1. Think quietly to yourself about the following questions. You can record your answers if you would like:
   a. What do I need in my life? Some examples are listed here:
      - Food
      - Clean water to drink or wash with
      - Space to live in
      - Air to breathe

2. What are things that I don't necessarily need but make me happy? You can also think of these as "wants." Some examples are listed here:
   - Space to play or gather with friends
   - Things that help me get around my community, like roads, buses, or bicycles
   - Places to buy or trade things
   - Products that I enjoy
   - A place to relax, be around living things, or enjoy quiet time
   - Pets or houseplants
3. How does my community help me get what I need and want? Are there places, buildings, spaces, services, or other things that help me?
4. Are my needs more important than the needs of other people?
5. Are my needs more important than the needs of other living things in my community?

Understand: *How can we investigate what our community needs to survive?*

Now that you have thought about what you need and want, you will work with your team to find out what other people in your community need and want. You will do this with an investigation. The information from this investigation is very important because you will use it again in Parts 4, 5, 6, and 7.

1. Discuss how you will investigate the needs and wants of the people living in your community. There are many ways to investigate. You could:
   a. Interview people in the community on the phone, online, or in person. Ask them about their needs and wants and how the community helps them meet those needs and wants. Remember that an interview is similar to the oral histories you collected in Part 2, Task 2, Understand. But instead of asking about the past you will ask people about what they know now. Go back to Part 2, Task 2, Understand if you need help with this kind of investigation.
   b. Survey people in the community about their needs and wants and how the community helps them meet those needs and wants. Remember that a survey is a list of simple questions that you can give to a group of people. For example, you can ask "Where do you go in the community to get clean water?" Go back to Part 2, Task 1, Understand if you need help with this kind of investigation.

c. Move around your research area and make observations about how people in the community are meeting their needs and wants. For example, where do you notice people buying or trading food? How do people in your community earn money? What makes people in your community happy?

d. You could also do an investigation using maps or photos of your community. This kind of investigation is described in *Investigation of Space in the Community*:

Investigation of Space in the Community

Take out the *My Research Area* map that your team made in Part 1, Task 4, Act. Make a copy of this map. Or if you are able, find a digital map or other kind of map that shows your research area with lots of detail. You need to be able to know what is in each part of the map. For example, it would help if your map had labels for buildings such as, "Community center" or showed the name of a park. If your research area is small and you can take an overhead photo of the entire area, that works well, too.

1. Consider the copy of your research map. You are going to notice how space is used in your community to meet the needs of people and other living things.
2. How much space is used mostly by people to meet their needs and wants? For example, buildings, parking lots, or schools. Find a way to show this on the copy of your map. For example, you could shade in those parts using a certain color.
3. How much space is used mostly by other living things to meet their needs? For example, an abandoned field, a nature preserve, or a river where no one is allowed to boat or fish. Find a way to show this on the copy of your map. Use a different way or color than you did in step 2.
4. How much space is used by both people and other living things to meet their needs and wants? For example, a park, a field where crops are growing, or a pond where both people and animals catch fish to eat. Find a way to show this on the copy of your map. Use a different way or color than you did in step 3.
5. Consider the copy of your research map. Notice the part of the map that is used mostly by people.

6. Notice the part of the map that is used mostly by other living things.
7. Notice the part of the map that is used by both people and living things.
8. Who is using the largest part of the research area? People? Other living things? Or both people and other living things?

2. Decide as a team how you will investigate.
3. Now that you have decided how you will get information about what people need and want, your team needs to decide what information you would like to get.
4. Discuss what you might want to find out about what people need and want. Some examples are listed here:
    a. What do the people in my community need?
    b. What do the people in my community want?
    c. Where do they go to meet their needs and wants?
    d. What do they do to meet their needs and wants?
    e. What is more important to the people in my community, a need or a want?
    f. Do people think their needs and wants are more important than the needs of other living things?
5. Next, work with your team to plan how you will do your investigation. 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, and who will collect the finished surveys.
6. Finally, do your investigation with your team.

Act: *How is our community meeting the needs of people?*

Your team has investigated what people in your research area need and want. Now, your team will share what you observed.

1. Take out the observations you recorded from the Understand activity.
2. Take out your *Part 3 Organizer*.
3. Have the team leader record what they found out in the Understand activity. They should put their answer in the *Know* column. For example, the team leader may

have learned from an interview that a person in the community needs money to buy food for their family and so they work at a factory to earn money. This person needs roads and buses to help them get to the factory. For this person, being able to earn money for their family is more important than protecting the habitat that the roads cut through.

4. If the team leader shares any needs or wants that you also found in your investigation, let them know. Circle that need or make some other mark. This will help you record that this is something that more than one person needs or wants.
5. Next, share the needs and wants you learned about in the investigation that haven't already been listed. Have the team leader record your observations or add them yourself if you are working with a digital or shared document.
6. You should now have a list of what the people in your community need and want.
7. Discuss what you learned about in the investigation as a team. Record your answer in the *Know* column.
    a. What are the things that people need and want most often?
    b. Where do they go to meet their needs and wants?
    c. What do people do to meet their needs and wants?
    d. What do people think is more important, a need or a want?
    e. Do people think their needs and wants are more important than the needs of other living things?
8. Take out your *Balanced Community Goals.* Review them with your team. Discuss the following question:
    a. Think about how people are using the community to meet their needs and wants. Does this match with the goals we have in our *Balanced Community Goals*?
    b. If not, what would we need to change about how people are meeting their needs and wants?
9. In the *Think* column, record what your team thinks about the following statement: My community meets the needs and wants of people but not of other living things.
    a. Do you agree or disagree? Why or why not?
10. Finally, under *Wonder*, consider what you don't know.
    a. What questions do you still have?

Task 4: What are the conflicts between people and other living things in my community?

In this Task you will ***discover*** how you think and feel about **conflicts** between people and other living things. Then you will use a case study to ***understand*** what can happen when people and living things have similar needs. You will ***act*** to figure out the conflicts you discovered in your investigations and think about what you would change about your community.

Discover: *How do I feel about conflicts between people and living things?*

Sometimes people and other living things have very similar needs or wants. For example, people need space to live, work, and grow food. They want space to relax and play. But other living things need space too. They need space to live, grow, or get food or energy. Sometimes people and other living things can share space. But other times, when people use space to meet their needs, they prevent other living things from being able to meet their needs. For example, if people build a road where plants are growing, those plants can no longer grow there.

1. Think about a time when you and another person both wanted the same thing. Maybe a younger sibling wanted one of your toys or items of clothing but you wanted to keep it for yourself. Or you and someone in your household both needed the bathroom to wash and get clean but only one of you could use it at a time.
2. Think quietly to yourself about the following questions:
    a. How did it feel to need or want the same thing as someone else?
    b. How did you decide who would get the thing you both needed or wanted?
    c. Which is more difficult for you: trying to share something you need or trying to share something you want?
3. When two people need or want the same thing, it can be difficult or impossible to meet those needs at the same time. This is called a conflict. A conflict is a kind of disagreement. There can be conflicts between people when they need or want the same thing. There can also be conflicts between people and other living things in a community when they need or want the same things.

4. Gather as a team.
5. Your team leader is going to share some conflicts between people and other living things in a community. You will share how you feel about each one. These conflicts will help you think about the four perspectives you learned about in Part 1, Task 3.
    a. If your team is together in the same room, you can move to or point to one part of the room to share how you feel about each sentence. Label three areas of the room "Agree," "Not Sure," and "Disagree."
    b. If your team is not together in the same room you can share how you feel about each sentence by holding up piece of paper on a video call, send your answer in a text, saying your answer out loud on a phone call, or typing your answer in shared digital document or website.
6. Have the team leader share the following conflicts one at a time. Each one is labeled with the perspectives it includes. Share how you feel about each conflict:
    a. Environmental, social, and ethical: Our community has some ants and wasps that bother people. It is okay to kill the ants and wasps because they are just insects.
    b. Economic and environmental: A company in our community is causing **pollution**. This pollution harms the plants, fish, turtles, and insects living in the river. But a lot of people in our community earn money at this company so we should let it keep polluting.
    c. Ethical and social: In order to protect the living things in our community we should make certain spaces into nature preserves. The people who live in those spaces now will need to find other places to live.
    d. Environmental and social: Our community has a pond that is a habitat for living things such as salamanders, beavers, and willow trees. But our community needs more space for people to have fun, have festivals, and eat together so we should fill in the pond to make that space.

⚠ Emotional Safety Tip

You may have a strong opinion about some of these statements. Remember to be respectful in how you share your thoughts and how you listen to others. It is okay to disagree but remember to disagree with ideas and not people.

Understand: *How can we learn about solving conflicts from others?*

Some people think about the conflicts between people and other living things because it is important to their way of life or it is their job. They want to help make balanced communities. These people think about and try to solve the same kinds of problems you are trying to solve in this guide. As you can guess, these can be difficult problems to solve! But you can learn from others to help you take action.

1. Your research mentors Ximena and Reynaldo try to protect the living things in their research areas. To do this, they have to think about how to balance the needs of people with the needs of living things. The following case study describes some of their work in Peru near a pipeline.
2. Read through the case study two times.
   a. The first time you read the case study, notice what the people need and want. Notice what they do to meet their needs and wants. Mark the sentences that describe what people need and want. You can underline, use a symbol, a highlighter, a different color pen, or another way.
   b. The second time you read the case study, notice what the other living things need. Notice what they do to meet their needs. Mark the sentences that describe what living things need. Do it in a different way than you did above.

Case Study

Remember that Ximena and Reynaldo study living things near a breakwater and pipeline in Peru. The pipeline is used to move a kind of **fossil fuel** called **liquefied natural gas**. This fuel is used to heat homes and cook food. The pipeline is owned

by several companies. When the people at these companies sell the fuel, they make money. They keep some of the money. The rest goes to the government of Peru. The government uses some of that money for things the country needs, such as roads, healthcare, or education. Some of the money goes directly to the communities where the pipeline or breakwater has been built.

The people at the pipeline companies want to make money by building and using the pipeline. But building a pipeline uses space. Some of that space is **habitat** for other living things. Habitat is the space that plants, animals, fungi, and bacteria need to live and grow. Building a pipeline can damage the habitat of living things. So before they started building the pipeline, the people at the companies asked scientists from the Smithsonian Institution to make a plan to protect living things.

Part of the plan was building the pipeline underground instead of on the surface. This involved digging a long hole, placing the pipeline in the hole, and putting the soil back on top. Sometimes, when the companies dug up soil that contained plants, animals, fungi, and bacteria they carefully placed the soil to the side. Once the pipeline was placed in the hole, the company put the soil back. This helped save many of the plants, animals, fungi, and bacteria that were living in the soil.

Figure 3.6: Construction equipment lowers the pipeline into the hole.

Building the pipeline underground allowed large animals to move around their habitat easily after the construction was finished. But some smaller animals could not move around easily until more plants grew back in the area. Reynaldo explains, "Most of the bigger animals like birds, foxes, and small cats have not been impacted by the construction. A 20-meter gap without plants is okay for them to cross. But for rodents and lizards, 20 meters is a huge area to cross. They could easily get eaten by a hawk. We needed plants to re-grow before these animals could cross the bare area left after the construction of the pipeline."

Figure 3.7: The bare ground shows where the pipeline has been buried.

The people at the companies also tried to avoid building in areas that were very important for living things. For example, if an area had **rare** plants, animals, or fungi, the company would not build the pipeline there. Or if the area had something that many living things needed, like a pond or a wetland, the companies would not build the pipeline there. But they could not always avoid those areas. Sometimes they had to build the pipeline anyway.

The pipeline ends near the ocean. Ships pick up the gas at a **port**. The company built a large structure called a **breakwater** in the ocean near the pipeline. A breakwater is a large pile of rocks that protects the port from waves and storms.

The area near the pipeline used to have a flat, sandy bottom. Now the breakwater has added many rocks to the area. This helps living things meet their needs. Ximena explains, "Some living things need the rocks to hide and build their homes." Living things like fish, crabs, octopus, and penguins use the breakwater as a home.

But there are also risks. Before the gas can go on ships it has to go through a special process. This process makes a lot of very salty water. The water is even saltier than ocean water. When this very salty water is released into the ocean it can harm the living things near the pipeline. Another risk is the living things growing on piles. Piles are the long columns that hold up the port. Ximena explains, "A lot of animals are growing on the piles. But they produce a lot of feces, or poop. This reduces the oxygen in the water. And when there is less oxygen in the water it's like having less oxygen in the air. Many other living things will leave and find other places to live. So once in a while you need to remove the living things on the piles."

Figure 3.8: The long pile of is the breakwater. It is located in front of the port. It protects the ships in the port from strong waves and storms.

3. Look at the sentences you marked in the case study. Think quietly to yourself about the following questions.
    a. Did the people and the other living things in the case study ever need the same thing?
    b. How did the people at the pipeline company try to fix these conflicts?
    c. How do you feel about the pipeline? Would you have decided to build it if you were in charge?
    d. The pipeline helps meet some people's needs. Is that more important than meeting the needs of the living things near the pipeline?

Act: *What kinds of conflicts exist in our community?*

Your team is working to create a balanced community. To help you do this, you need to find out if the people and other living things in your community have similar needs. Having similar needs can cause a conflict. The more you know about those conflicts, the more prepared you are to take action.

1. Remember that in the Discovery activity you thought about a time when you and another person needed the same thing. Your team is going to think about the same kind of conflict. But this time you will try to find out what both people and other living things need.
2. If you would like to learn about an example of a conflict between people and the other living things in a community, read the following case study. It describes a conflict between people and other living things on the land that the Ese'Eja used to own. If you don't have time to read it you can skip to the next step.

Case Study

Remember that the Ese'Eja used to own a large area of land in Peru. But the government of Peru created a new law that took away 96% of that land.

Now other people use the land that the Ese'Eja used to own. They cut down trees to get wood for building things or for fuel. Sometimes they even do this

illegally, which means without permission. Some people dig into the ground to get gold so they can sell it for money. These other people are getting what they want and need by using the land and the living things there. But these other people are making it difficult and sometimes impossible for other living things to meet their needs.

Many kinds of living things in this area need the trees for food, a home, and a place to raise young. When the trees are cut down other living things cannot meet their needs. When people dig into the ground to get minerals they also pollute the rivers. When the rivers are polluted the things living there cannot meet their needs.

Figure 3.9: People can use trees for fuel and building materials. But trees are also an important habitat for many kinds of living things.

The actions of other people make it difficult and sometimes impossible for the Ese'Eja to meet their needs. The Ese'Eja explain that "When the habitats of birds, amphibians, mammals, insects, and plants are gone, the creatures lose the ability to survive. When there are no more peccaries and monkeys to hunt, or nuts and seeds to gather, our way of life will be lost … No longer will our grandfathers show the children how to make hunting bows, or gather macaw feathers to put on the arrows. Our grandmothers will not be able to show their granddaughters how to weave baskets or make our traditional cloth."

3. Take out your team's *Part 3 Organizer*.
4. Consider the information in the *Know* column of your *Part 3 Organizer*. Discuss these questions as a team:
    a. Do you notice that people and other living things in your community need the same things?
    b. How could this cause a conflict?
    c. For example, you may have observed that fish in your research area need a pond to live, grow, raise young, and find food. But people need the same pond to catch animals for food. And they want to use the pond for relaxing and playing.
    d. Or you may have observed that people in your community use roads and cars to get to their jobs so they can earn money. But those roads and cars make it difficult for animals in your research area to move around safely to look for food. The pollution from the road makes it difficult for plants and fungi to grow.
5. Record your answers in the *Know* column.
6. Consider the list of conflicts your team just made.
    a. Who got their needs met in each conflict? People? Other living things? Both?
    b. Why do you think this is?
    c. What would you do differently?
7. Record your answers in the *Know* column. You will come back to these answers in Part 7.

Task 5: How can I take action to balance needs in my community?

Change happens on different levels. There are things you can change about your own behavior. There are also changes that happen within the whole community. In this task you will ***discover*** what you know about changes needed for your community. Your team will use this information to decide on your community action plan in Part 7. You will also ***understand*** some ways you can personally change your behavior to help your community. Then you will ***act*** on those ideas.

Discover: *What are the most important conflicts in our community?*

In any community there are people and other living things trying to meet their needs. Sometimes these needs cause conflict. Now you will use what you have learned in this Part to think about ways you could make those conflicts better.

1. Take out your *Part 3 Organizer*.
2. Your team has already listed information you found out from your investigations in the *Know* column. Add any additional information you want to remember.
3. Now you will list or draw everything your team thinks about your community under the *Think* column. Consider:
    a. What do we think are the most important conflicts to solve between people and other living things in our community?
    b. What do we think are some good ways to try to solve those conflicts?
    c. Do we think our community could do better at meeting the needs of living things?
4. Take out your Balanced Community Goals. Compare them to the things you *Know* and *Think*. Your Balanced Community Goals show you how your team wants your community to be. What you *Know* and *Think* shows you how your community is. When your community is not the way you want it to be, that is a problem.
5. As a team discuss:
    a. Did we find any information from our investigations that shows we are not meeting our Balanced Community Goals?
    b. Record those now in your *Think* column.

6. Think back to the investigations you did in Part 2, Task 3, Understand about who makes decisions in your community. Think about how people your age are involved in making decisions.
    a. Which conflicts do you think you could take action on?
    b. Which conflicts would you need help with?
    c. Record those now in your *Think* column.
7. List or draw everything your team still wonders about your community under the *Wonder* column. Consider:
    a. Are there questions you still have about how your community meets the needs of people and other living things?
    b. Are there actions you could take that might help your community balance the needs of people and living things?
8. Keep the *Part 3 Organizer* safe. You will need it again.

Understand: *How can I choose an action to take in my community?*

In this Part you investigated how the living things in your research area meet their needs. You also learned how the people in your community meet their needs and wants. You noticed how those needs might cause conflicts. You thought about ways that your community could better balance the needs of people and other living things. You will have a chance to put some of these ideas into action in Part 7. However, there are always ways that you could make things in your community better through your own individual actions.

1. Consider the *Think* and *Wonder* sections of your *Part 3 Organizer*. Are there any problems that you could help to change all on your own? Are there any actions you could take on your own?
2. Discuss your ideas with your team. For example:
    a. Maybe you noticed that most of the space in your community helps only people meet their needs. You could add something to the space outside of your home to help meet the needs of living things, like a plant that is native to your area. That plant could be a source of energy or habitat for animals, fungi, or bacteria.

b. If you know a construction project is about to happen in your community, you could share some of the solutions you read about in Case Study #1 with the people managing the construction.

c. You could make choices about the things that you buy or do that reduce the amount of waste or pollution coming from your household.

d. You could work with the people in your household to make a list of your needs and wants. Then, you all could think about which needs and wants might make it difficult for other living things to meet their needs. Are there any things that you need or want that you could use less of?

e. You could ask a member of your household to do one of the observations or experiments from this Part with you so they learn more about the needs of people or living things.

f. Come up with your own ideas.

3. Read some examples of action from your research mentors, Ximena and Reynaldo.

Ximena says…

For any kids near the coast, where there are boats, I would have them ask about the quality of the water. How are people handling the water that is used to clean boats? How are people getting rid of the oil from boat motors? Is there a cleaning or recycling system for the water near the boats? Just knowing would be great.

Reynaldo says…

I think we're at a part of history where every person has the power to do things, even if it's small things. It's great if a kid says, "I'm recycling, or I'm walking instead of taking the bus, or I'm using my bicycle instead of being driven to school." Small things show that there are **alternatives** and that we can contribute to something the world needs. Everything that you can do, even if you think it's little, is definitely a huge contribution.

4. Think quietly to yourself about a change you want to make in the way you act. Why do you think this change is important?

Act: *How can I plan an action in my community?*

Changing our own behavior is often the first step. Now that you have decided what you will do to improve your community, you need to put that idea into action.

1. Make a plan for how you will put your idea into action. If you need to share information, where, when, and with whom will you share it. If you need to do something, what do you need to do it.
2. Put your plan into action.
3. Quietly reflect on your action by yourself:
    a. What seemed to go well?
    b. What was hard?
    c. Were you able to make the changes you thought you would be able to make?
    d. Will you keep going with your change or are there things you would do differently in the future?

Congratulations!

You have finished Part 3.

Find out More!

For additional resources and activities, please visit the *Biodiversity!* StoryMap at https://bit.ly/3zvJ2Qh.

Glossary

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

Alternative: Another choice or way of doing something

Biodiversity: The many different living things on Earth; or a measurement of how many different living things are in an area

Breakwater: A large structure that protects a port from waves and storms and allows ships to safely approach

Classify: To name or identify and sort into groups

Conflict: A disagreement

Fossil fuel: A type of fuel that comes from the fossilized remains of plants and animals

Habitat: The space that living things need to live and grow

Illegal: Without permission or against the law

Liquefied natural gas: A type of fossil fuel

Pipeline: A structure that moves a gas or liquid from one place to another

Pollution: Materials that harm the environment or things living in it

Port: A place where ships can stop

Rare: Not often found or very few left

Other Words:

