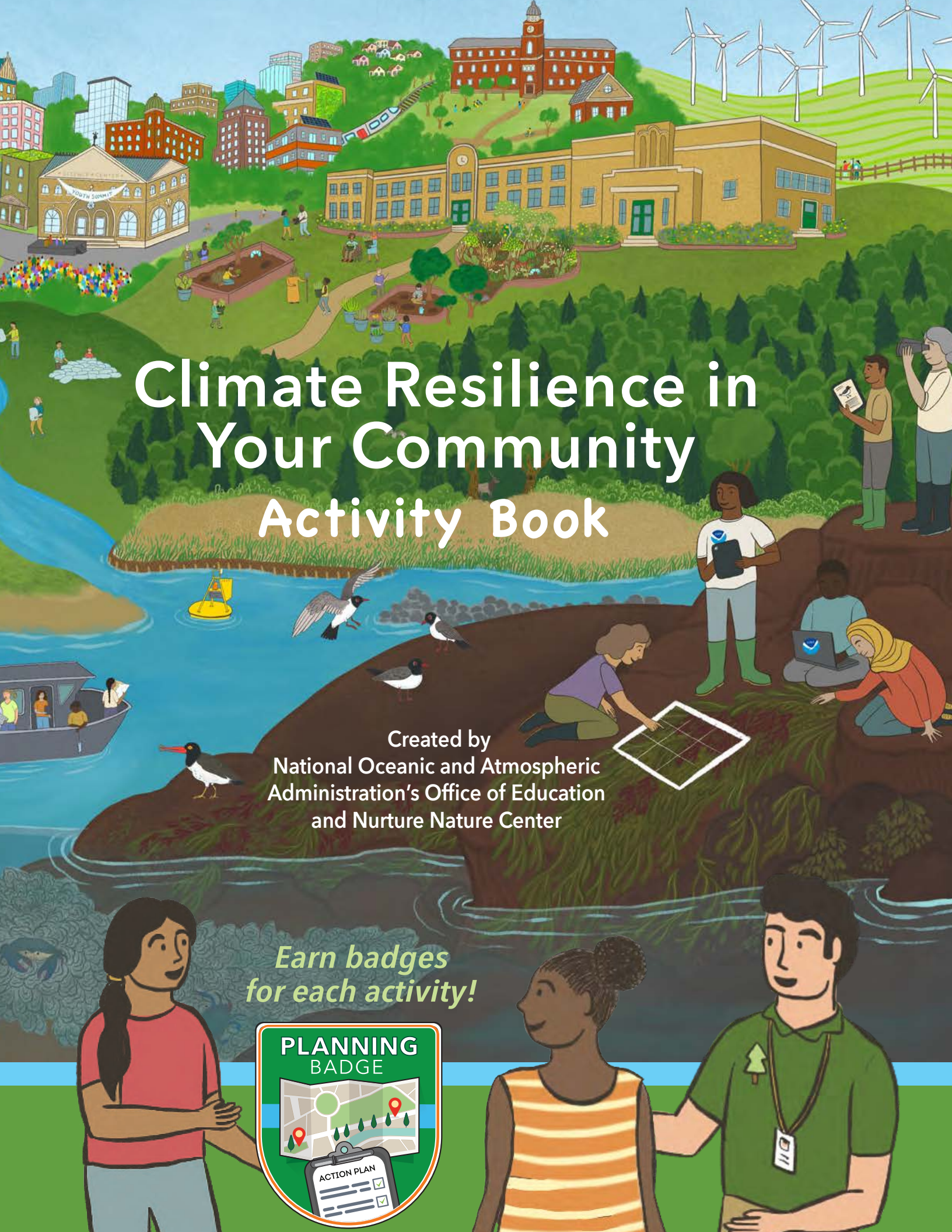


Climate Resilience in Your Community

Activity Book

Created by
National Oceanic and Atmospheric Administration's Office of Education and Nurture Nature Center

Earn badges for each activity!

Acknowledgments

The authors would like to thank everyone who gave their time, attention, and expertise to reviewing and commenting on various iterations of the Climate Resilience in Your Community Activity Book.

Authors: Maggie Beetstra (NOAA Office of Education) and Kate Semmens (Nurture Nature Center)

Contributors: Maggie Allen, Shadaesha Green, Carrie McDougall, John McLaughlin, Christopher Nelson, and Sarah Schoedinger—all from the NOAA Office of Education; Rachel Hogan Carr and Keri Maxfield from Nurture Nature Center; Sheryl Sotelo from Chugach School District; Robin Saha from the University of Minnesota; Lowana Greensky, Turtle Mountain Band of Ojibwe; ZhaaZhaawaanong Greensky, Little Traverse Bay Band of Odawa, University of Minnesota Duluth Medical School MS1; Beth Trowbridge, Center for Alaskan Coastal Studies; Courtney Kowalczak, Fond du Lac Tribal & Community College; and Ronald R Willis Jr, Little Traverse Bay Band of Odawa, Fond du Lac Tribal & Community College

Design: Keri Maxfield, Nurture Nature Center

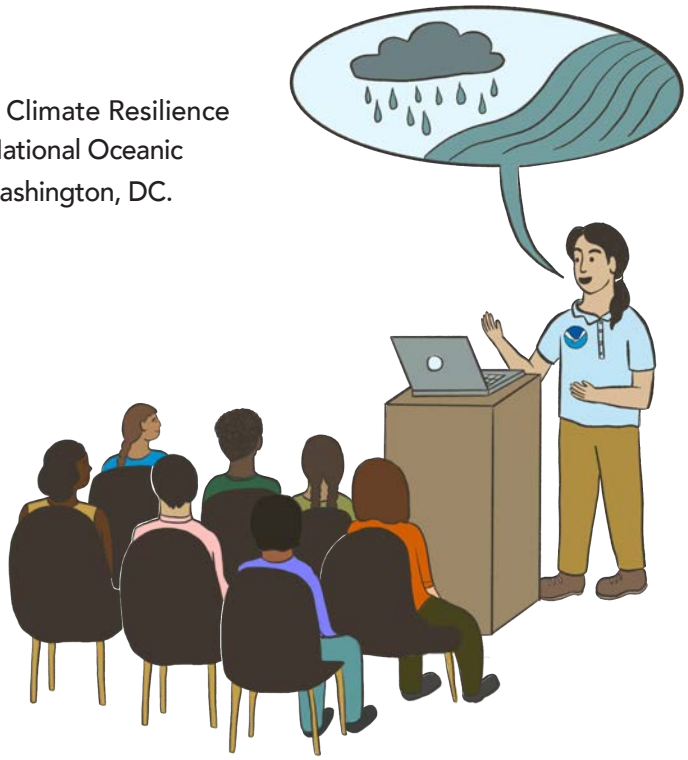
Illustrations: Jessica Bromley Bartram Illustration & Design (jessicabartram.ca)

Additional illustrations: Tom Maxfield, Nurture Nature Center

© This publication may be redistributed non-commercially in any media, unchanged and in whole, with credit given to the NOAA Office of Education.

Published in 2022

Suggested citation: Beetstra, M. & K. Semmens. 2022. Climate Resilience in Your Community Activity Book. National Oceanic and Atmospheric Administration, W ashington, DC. *doi:10.25923/tcz6-1p93*



Published by the NOAA Office of Education

noaa.gov/resilience-activity-book

An accessible version of this report and other related materials are available at the site listed above.

Contact us: oed.grants@noaa.gov

NOAA's Environmental Literacy Program

The National Oceanic and Atmospheric Administration (NOAA) is a government agency with a mission to understand and predict the changing environment, from the deep sea to outer space, and to manage and conserve America's coastal and marine resources. NOAA's Environmental Literacy Program (ELP; https://www.noaa.gov/office-education/elp) supports projects that both inspire and educate people to use Earth system science to increase ecosystem stewardship and resilience to extreme weather, climate change, and other environmental hazards (NOAA Education Strategic Plan, 2021-2040: https://www.noaa.gov/education/explainers/2021-2040-noaa-education-strategic-plan). In 2015, ELP grants shifted from focusing on climate change education to community resilience education. The program builds capacity for institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. Learn more about current and past projects at https://www.noaa.gov/office-education/elp/grants/awards.

ELP Theory of Change

To create a framework within the ELP community and advance the field of environmental education, we developed a community resilience education theory of change to communicate the philosophy guiding our grants program (https://www.noaa.gov/elp-resilience-TOC). It provides a new way for us to demonstrate the value of K-12 formal and informal education in local, state, and national efforts to build community resilience to extreme weather, climate change, and other environmental hazards. It also demonstrates the ways in which ELP fills a gap in resilience-building approaches more commonly underway. NOAA's other resilience efforts focus on creating and promoting the use of science-based information in a work-related context. While building this capacity for workplace use of science-based information is essential, so is equipping people with the environmental literacy necessary to make informed resilience decisions in their everyday lives. When community members become engaged in resilience issues and make informed decisions, they reinforce the efforts of resilience practitioners and local or state officials. In addition to explaining why this is important, our theory of change also outlines how this occurs. We will use the theory of change to aggregate effective approaches and outcomes identified by our grantees in the future.

Nurture Nature Center

Nurture Nature Center is a non-profit based in Easton, PA, dedicated to engaging youth and adults in learning about environmental risks and building community resiliency by leveraging the power of informal science education, engagement in the arts, and community dialogue and networking. Programming that helps the community build knowledge about a range of timely and important environmental topics is provided at the center, which features a NOAA Science On a Sphere® exhibit, art gallery spaces, and urban recycle garden. Programming includes community presentations and events around resiliency, climate change action, and stewardship. NNC also conducts social science research and outreach about flooding, hazards, and risk communication. For more information about Nurture Nature Center visit https://nurturenaturecenter.org/.

Table of Contents

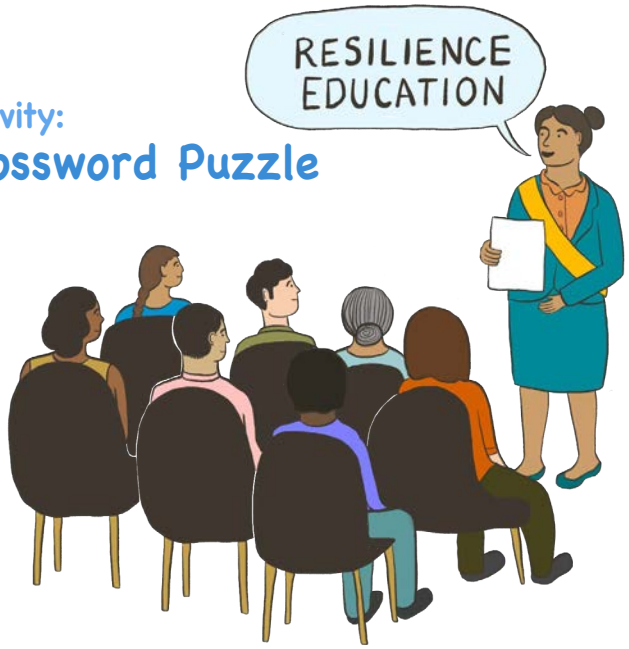
For more information about this activity book, and access to an educators' guide and relevant resources, please visit:

Think about where you live. Have you ever been in a strong storm? Have you ever experienced flooding, a wildfire, or really hot days? These types of environmental hazards are happening more often because of climate change. Even though these events can be scary, there is so much you can do in your own community to make it better able to handle these challenges. When we work together to protect our communities from environmental hazards, we are building community resilience.

In this activity book, you will learn all about community resilience and discover ways that you can make a difference. While you do the activities, keep track of your points. You will earn a badge at the end!

Activity:

Crossword Puzzle



The climate is changing, and it is important that people and whole communities are ready to act. An important way to reduce **vulnerability** to extreme weather, **climate change**, or a similar **hazard** is to increase community **resilience** at the **local** level. The effects of climate change place some groups of people at higher **risk** of climate-related **impacts** than others, so **equity**, inclusion, and **justice** must be central to **community** resilience education efforts. Federal agencies like the National Oceanic and Atmospheric Administration (**NOAA**) and local organizations like Nurture Nature Center are working to increase community resilience by improving environmental **literacy**, which leads to increased community engagement and **civic**, or government, action. For example, creating a **rain garden** allows **diverse** community members to **collaborate** to improve their community together. If community members study the impacts of the rain garden, then they are engaging in **citizen science**. These efforts help to tackle both climate change **mitigation** and **adaptation**, since both are equally important and urgent. Although there is **uncertainty** about what the future holds, increasing community resilience will help to improve people's lives and the environment.

Now that you've read a bit about the importance of building community resilience, it is your turn to learn more about some basic vocabulary words that will appear throughout this activity book. Fill out the crossword puzzle using the bolded words in the paragraph above and the clues on the next page.

NOAA supports many different projects that help communities manage the risk of climate change impacts through collaboration, working together to reduce vulnerability to hazards for everyone.

A group of Pennsylvania students working with a community organization talked to their neighbors and friends about their experiences with hazards like flooding and extreme heat. After these conversations, they added photographs to their stories to create a photovoice exhibit that community members could visit. The students' work served as a backdrop for a community discussion about what residents and leaders could do to make the community more resilient to changing environmental hazards.

Maria, a student in Arizona, worked with the rest of her class and teachers to learn about and plant a rain garden at school with the help of a community organization. With her family, she also planted a rain garden and shade trees in her own backyard. These actions will help to keep extreme heat manageable while conserving water.

These are just two examples of the many activities you can explore and undertake in your own community to help be better prepared for environmental hazards. When we take action like this, we are increasing community resilience.

Complete the crossword puzzle below

Across

3. relating to government
4. working together toward a shared goal
6. an event or condition that may cause injury, illness, or death to people or damage to property
7. effects on life and places that result from hazards
8. being able to plan for, recover from, and adapt to negative impacts
10. the fair treatment and meaningful involvement of all people and that no one bears a disproportionate share of negative impacts
11. opposite of global
12. being at risk for a negative outcome
14. changes in the average temperature and precipitation of a place over time
16. actions that reduce emissions that cause climate change
18. amount to which future conditions are known
19. knowledge and understanding of a wide range of environmental concepts

Down

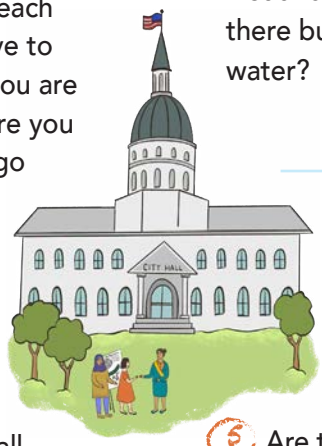
1. many different perspectives
2. National Oceanic and Atmospheric Administration
4. individuals volunteering to work together on science projects
5. planning for and adjusting to impacts from climate change
9. a group of systems, including natural, built, and social systems, governmental and economic systems, that sustain and shape lives
13. an area planted with specific plants to take up water
15. balanced, fair
17. potential for negative outcome

*Points- give yourself 10 points for completing the crossword: /10

Activity:

Exploring Your Community

Every community has people, places, and resources that contribute to resilience. See if you can find these assets within your own community by answering the questions below. You can get points for each question you answer, but you do not have to answer all the questions. Pick the ones you are most interested in figuring out. Make sure you enlist the help of a trusted adult as you go out in search of these things.



About Your Community

Community name:

1. Does your community have a City Hall or other center of decision-making? Describe it here. Is it at the center of your town?

2. Is there a community center or place that people in the community like to gather? Why do you think people like to gather there?

Natural Environment

3. Are there green spaces in your community, like parks or gardens, botanical centers, or other special natural areas like forests and mountains? Which is your favorite to visit (or if you haven't visited it, which do you want to visit the most)?

4. Is there a river or creek that runs through or next to your community, or is your town next to the ocean or an estuary? What does the land look like right by the water's edge? Are there riparian buffers (areas of wetland, grass, bushes, and trees) by the water, or are there buildings and man-made surfaces next to the water?

tting Around Your Community

5. Are there paths or sidewalks so that you can walk safely to the parks and learning centers identified in your community? Look up your town's walkability score at https://www.walkscore.com/ and note it here.

6. Do you need a car to get around your town? Is there a bus system, train, subway/metro, or other public transportation? Are there bike lanes for bicyclists? Are there bike, scooter, or car share programs?

Environmental Hazards

7 What environmental hazards affect your community? (Examples of hazards include flooding, extreme heat, sinkholes, wildfires, hurricanes, tornadoes). What was the most recent hazard? Find a news article about it or get a first hand account from a neighbor and summarize it here.

8 Does your community have a resilience or climate action plan? See if you can find the plan and the year it was created. If your community does not have a plan, try to find one from a similar community.

Learning and Action in Your Community

9 List all the places for education in your community. Be sure to include both formal (elementary and secondary schools and colleges/universities) and informal (science or nature centers and libraries) centers of learning.

10 Are there organizations working in your community to help make it better? What is the name of one of these organizations, and what are they doing to improve the community?

*Points- Give yourself one point for each question answered.

____ /10

Activity:

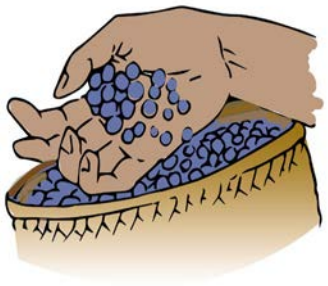
Exploring the Seasons

Communities across the globe are impacted by environmental hazards and climate change. Scientists and community members can work together to study these hazards and climate change, each providing valuable information. In Indigenous communities, this input is recognized as traditional ecological knowledge. According to the White House, traditional ecological knowledge is a "body of observations, oral and written knowledge, practices, and beliefs that promotes environmental sustainability and the responsible stewardship of natural resources through relationships between humans and environmental systems". This knowledge is gained over generations of living off the land, observing changes, and sharing information through stories passed on by the older generation to the younger generation.

Since traditional ecological knowledge is focused on a specific environment and culture over time, it provides an in-depth understanding of a place. The scientific studies that include traditional ecological knowledge are the ones that contribute the most complete results. Many Indigenous researchers have been utilizing traditional ecological knowledge for many years to provide insight into hazards and climate change.

Let's explore an example of how traditional ecological knowledge can help us in our understanding of the local environment. First, think about your favorite outdoor activity. Draw yourself doing that favorite activity and the season when it happens. Then review the traditional seasons and activities in the two tables on the next two pages.

Traditional subsistence seasons



Subsistence is the act of harvesting plants and animals from the local environment for survival during specific times of the year or seasons. On the Arctic coast of Alaska, the Iñupiaq peoples define the seasons by the availability of resources. The table below describes traditional subsistence seasons for the Iñupiaq communities and changes in their environment affecting subsistence that they have observed.

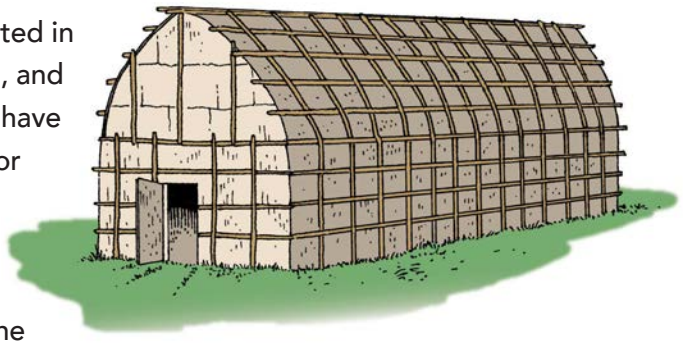
Season	Month/s	Description	Observed Change
Tom-cod	January	Chop holes in ice near shore and jig for tom-cod.	Delayed sea ice development.
Winter Caribou, Crab	February, March	Caribou hunting inland. Use baited wire to catch crab through ice.	Variable weather conditions.
Whaling	April, May	In late March or early April, flocks of snowbirds are migrating and in the ice leads, bowhead and beluga.	Thin ice conditions interrupt sea ice-based hunting.
Bearded Seal, Seal Ducks, Geese	June, July	Sea ice breaks up and hunters switch to open boats to hunt bearded seal and seal species. Bird hunting.	Poor ice conditions.
Summer Caribou, Egg Gathering, Salmon, Arctic Char	August	Caribou often come down to the coast in summer and can be hunted by boat. Catch fish and trout with beach seine nets.	Temperature is too hot for drying fish and meat.
Fall Caribou, River Fish	September, October	Hunting for caribou until river freezes up, also time in fish camps, berry picking, and hunting ptarmigan and other birds.	Delayed caribou arrival.
Seal, Polar Bear	November, December	Venturing out onto the sea ice hunting seal and occasionally polar bear.	Delayed sea ice development.

Foote, B. (1992): The Tiagara Eskimos and Their Environment. North Slope Borough Commission on Inupiat History, Language and Culture, Point Hope, Alaska.

The calendar looks different for Indigenous communities everywhere. In Northern Minnesota, this Anishinaabe calendar is representative of the seasons followed by the Saywer community on the Fond du Lac Reservation (Nahgahchiwaanong).

Ziigwan	February - early May	Spear fishing and trapping. Start the sugarbush (maple sap collecting).Tap Balsam trees for pitch to make zhingob (waterproof sealant used in many things).	Variable weather conditions increasing. Poor ice conditions. Changing crow migration.
Niibini	Early May - August	Begin gardens. Tan hides that were collected in the winter. Berry picking, medicine harvesting, birch bark harvesting, canoe building, deer and bird hunting, traveling, games, and ceremonies. Start caring for the wild rice and get ready to go to rice camp.	Variable weather conditions increasing. Animals coming out of hibernation earlier. Deer flies coming out later.
Dagwaagin	September - early November	Wild rice harvesting and processing. Building longhouses, setting up winter camp, setting traps, and setting the last fish nets.	Increased flooding. Variable weather conditions increasing. More severe storms. Too wet for drying rice.
Biiboon	November - January	Get dog sleds ready and move winter camps farther in the woods. Story telling, beading, making clothes, snaring rabbits, trapping, and hunting.	Variable weather conditions affect harvest.

Information passed down through oral history by Jacob Greensky. Author of calendar: ZhaaZhaawaanong Greensky



Think about the activity you drew and the season that went with this activity. How does it differ from the activities and seasons listed in the tables? Think about all the major activities, family events, and special holidays you participate in over the year. Maybe you have activities you do outside of school (sports, music, art, outdoor activities). Maybe you do something special with your family or friends at a certain time of year. Maybe your summers have different activities than during the school year. List these activities in the table on the next page and the general time of the year (you can list the months they occur). Then briefly describe the activity.

Activity	Time of Year	Description of Activity

How is the table of activities you created the same or different from the first two tables?

In your own community and whenever you travel to another community, it is important to learn about the Indigenous Peoples who were, are, and will continue to be stewards of the land.

What is the Indigenous group that has been occupying these lands? Please visit https://native-land.ca/ to learn about the Indigenous territories where you live. You can also text (907) 312-5085 with your zip code or the city and state you are in to get information about the native lands that correspond to your location.

Indigenous Peoples who have lived and still live on the land should be acknowledged with a sincere statement of gratitude for their long term care and stewardship of the land. Stewardship is the responsible use and protection of the natural environment through conservation and sustainable practices to make the ecosystem more resilient and improve life for people. Stewards connect to their local ecosystems and understand how their individual actions affect the environment.

What natural resources are you grateful for in your area?

How are you connected to the land where you live?

How can you be a good steward of your local environment?

*Points- give yourself 5 points for drawing an activity, 5 points for creating your own table of activities, and 5 points for answering the questions related to gratitude, connection, and stewardship.

/15

Activity:

iSpy and Community Tour

Welcome to Resilience City! This community represents a vision of the future where children, youth, and adults are learning together and are directly engaged in activities that improve the resilience of their community. Institutions, including museums, aquariums, schools, universities, companies, and centers of government, are also working to increase community resilience. Looking at the image on pages 12 and 13, try to find as many of these indicators of a resilient community as you can. When you find one, circle it in the illustration and check it off the list before moving to the next one.

Places for Learning and Action

- ❑ Aquarium
- ❑ Planetarium
- ❑ Library
- ❑ Science Center
- ❑ City Hall (a place where youth and adults can present their ideas to officials)
- ❑ A group of students gathered outside to show support for resilience action

Energy Sources

- ❑ Solar panels (an example of renewable energy)
- ❑ Wind turbines (another example of renewable energy)

Being More Sustainable

- ❑ People planting trees
- ❑ Building with green roof (roof that is covered with plants/vegetation)
- ❑ Building with green wall (walls that are covered with plants/vegetation)
- ❑ Teachers and students creating a rain garden

Preparing for Environmental Hazards

- ❑ Elevated houses/houses on stilts (adapted for severe storms, flooding, and rising sea levels)
- ❑ Hurricane shutters
- ❑ Sandbags for minimizing flooding impacts
- ❑ People restoring/planting wetlands to help minimize flooding effects
- ❑ People protecting the shoreline

Getting Around

- ❑ People riding bikes (instead of taking a car)
- ❑ People walking (instead of taking a car)
- ❑ Train (an example of a mass transit option)

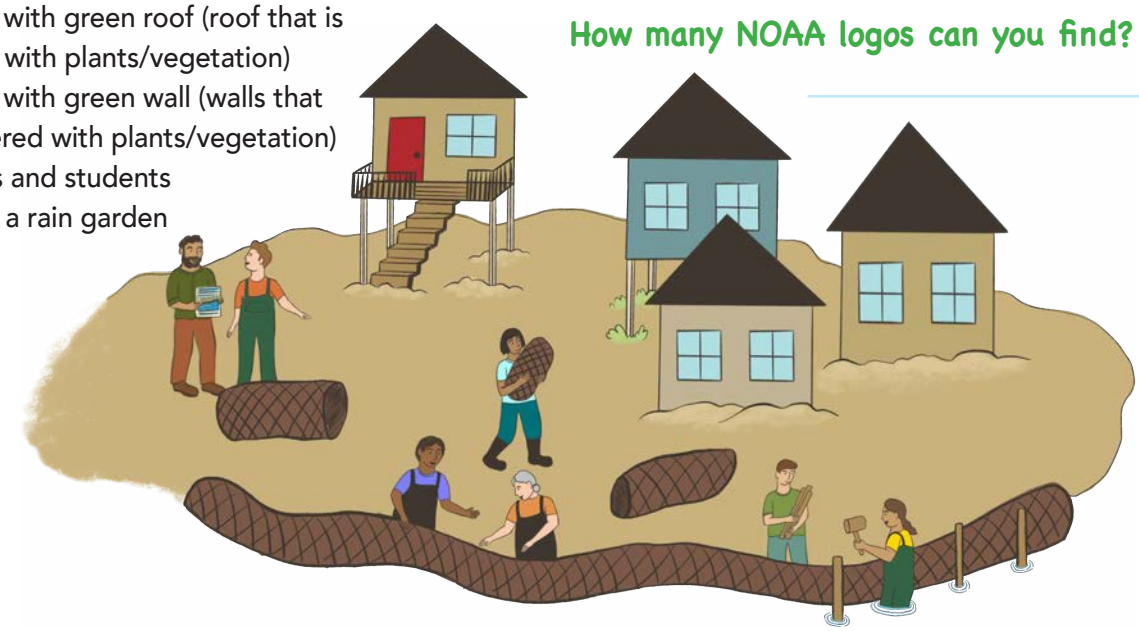
Taking Part in Science/Research

- ❑ Weather station being used to collect data
- ❑ People observing/counting birds for a citizen science project
- ❑ People on a boat conducting research on water quality
- ❑ NOAA staff collecting data along with public volunteers on seagrasses/wetland plants

Carbon Storage

- ❑ Healthy forest
- ❑ Healthy underwater ecosystem
- ❑ Healthy wetland

How many NOAA logos can you find?



Now it is time to think about your own community. Even if you did not notice before, there are likely activities happening in your community to make it more resilient just like in Resilience City. With the help of a trusted adult, try to identify five places you would show a visitor that showcase how your community is working to become more prepared for extreme weather and climate change. Use the activities shown in Resilience City for ideas of actions in your own community. While looking around your community, also keep track of the places where more progress is needed.

Draw a map of your community below. On the map, draw five places where your community is resilient or increasing its resilience. Then, draw three places in your community where more progress is needed.

Points- Find at least 10 items in Resilience City and give yourself 10 points. Give yourself another 10 points for drawing a map of your community. Put the total number here: ____/20

Resilience City

Activity:
Writing a Headline and Short Article About Environmental Justice

Environmental justice is the idea that 1) all people have the right to a healthy living environment, 2) the laws and policies in place should provide equal protection to everyone to ensure this right, and 3) everyone has equal access to information and the ability to contribute to the decision-making process that affects one's environment. The U.S. Environmental Protection Agency defines environmental justice as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

Environmental justice can relate to a range of environmental issues and conditions. Some examples are highlighted here with four short newspaper articles for towns in the U.S. Read the headlines and paragraphs for each and then create your own news article (headline and paragraph) using the guidance that follows the examples.

During extreme heat, a few blocks can mean the difference between 80 and 100 degrees Fahrenheit in Heatersville, USA

As the most dangerous weather hazard, heat waves affect certain neighborhoods more than others because of the type of development that occurred there and the investment, or lack of investment, in features such as parks and other green space. In Heatersville, residents that live on the 400 block of Heat Street experience temperatures that are on average 10 degrees Fahrenheit warmer that those living on the other side of the city near the park by Main Street. This is a big issue in July, when heat waves of 100 plus degrees typically affect the area. Heat Street tends to have households that are considered low income and are not able to pay for high electricity bills associated with a lot of air conditioner use. While Heat Street has affordable housing, it has not had investment in the past to preserve green space, plant trees, and create parks, all features that would help reduce extreme heat and its impacts. The difference between the Heat Street and Main Street communities highlights this environmental justice issue which is made worse by increasing temperatures due to climate change and increasing frequency of heat waves. Efforts to map urban heat islands (where areas dominated by concrete and asphalt are warmer than surrounding suburban/rural areas) and target solutions to those areas most impacted have started and need to continue.

Gridlock is just one of the negative impacts of the main highway in Highwaytown, USA

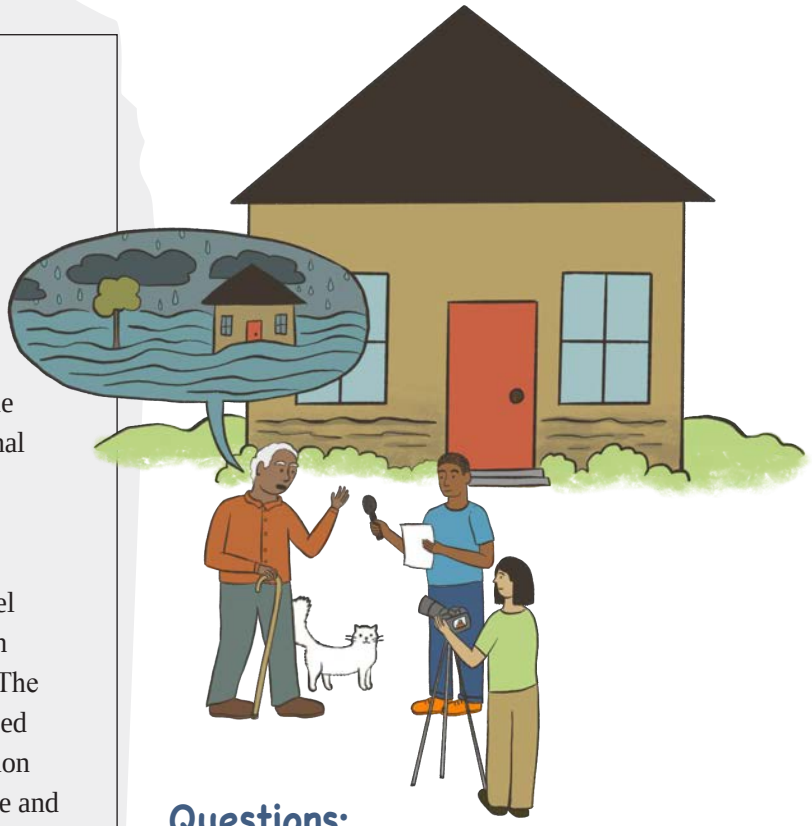
It may seem like a necessity, a way to connect the community and provide a means to get from one part of town to another. However, the I-1234 corridor has commuters who drive an average of two hours in gridlock each week and is the result of planning that routed the highway directly (and arguably, purposefully) through Highwaytown's poorer neighborhoods and Black communities. After the Federal Aid Highway Act of 1956, the government started taking many homes in these communities by eminent domain, which is where the government takes private land (after payment) for public use, in order to build something, like the highway. Highwaytown is dominated by cars, and there is less investment in public transportation and bike lanes. Since a majority of poorer and Black homes and schools are located near major roads, they have more exposure to higher levels of pollution, more safety concerns, and lower physical and economic mobility.

Uranium mine brings both economic opportunities and health impacts to the community

A productive uranium mining site on the American Indian Reservation near Minington brought economic opportunities and jobs, helping to reduce its high rates of poverty. However, when the mining initially began, the community living near the mine was not warned about radiation hazards. The residents now experience significantly high rates of cancer, kidney disease, birth defects, and other health issues, with cancer mortality rates that are 40 percent higher than the overall population. The mining companies have since abandoned the mines, leaving large amounts of uranium waste on the Reservation. The community continues to seek assistance in getting the companies to clean up the waste and are looking to the federal court system to get compensation for the harm imposed by the mining activity. A proposed $600 million settlement with two of the uranium mining companies is being discussed.

Hardest hit by Hurricane struggle to recover

The East neighborhood of Floodburg is a predominantly Black community in the city and is located south of the Floodburg Canal, a shipping channel. In August, a major hurricane made landfall causing the levee walls of the canal to break, leading to devastating flooding of the neighborhood. The water, 12 feet deep in some places, pushed houses from their foundations. A storm surge generated by the shipping channel destroyed much of the neighborhood, with even the highest spots in the neighborhood flooded. The construction of this channel in the 1950s replaced areas of coastal wetlands that served as protection from storm surges. Recovery from the hurricane and the flooding has been slow in the East neighborhood, especially compared to the city as a whole. Almost 90% of households in the city have returned after the hurricane, but only 37% returned in the East neighborhood. City crews have been busy fixing neglected streets along the Floodburg Canal with plans for new water and sewer infrastructure, roads, and sidewalks. There is still much work and investment needed to help the neighborhood recover and to increase resilience against future hurricanes and storm surges.



Questions:

- Are you comfortable sharing your stories with me?
- What is the community like where you live?
- Has your community made decisions about the environment that did not treat or involve everyone fairly? (you can make this more specific if you are focusing on a particular issue such as extreme heat impacts or toxic waste)
- What was your experience? What did you witness?
- What resources or information would be helpful for addressing the environmental justice issue?
- Are there lessons learned for the community about the issue you described?
- What would you like people to know about environmental justice issues in your community?
- What hopes do you have for your community's future?

To create your own news article, you can research an environmental justice issue in your community or, with the help of a trusted adult, seek out a person or people to have a conversation with about environmental justice within your community. This person or people may have experienced impacts related to environmental justice firsthand or may know about the issue in your community. You can use the questions on this page to help guide your discussion/investigation to inform your article.

Headline:

Paragraph describing the issue and any action taken to address it:

*Points- Give yourself 5 points for talking with a community member or researching an issue and 10 points for writing the headline and article summary:

____/15

Activity:

Telling a Story and Taking Action

There are a number of people depicted in the images on this page and the next taking positive actions within their community to make it more resilient. Each has their own story and situation. Choose one character and write a short narrative about that person.

Develop who that person is, what they are doing, when they are taking action, where they are, why they are there, and how they relate to the community/ local environment (i.e., Jordan helps with a citizen science project to understand how the coastal environment is changing).

Who?

What?

When?

Why?

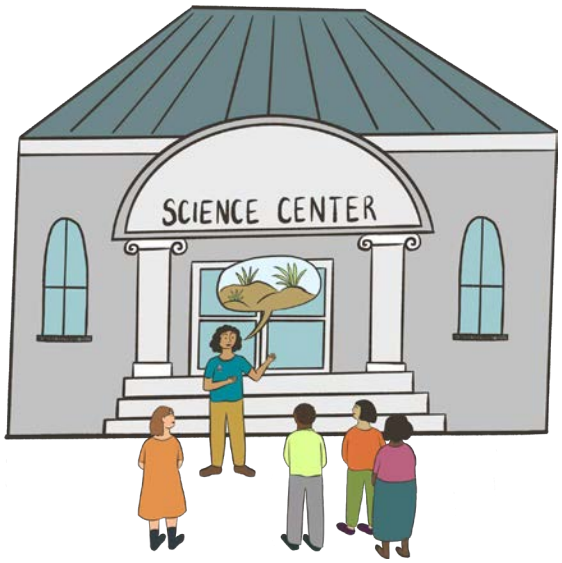
Where?

How?

Ideas for Actions You Can Take

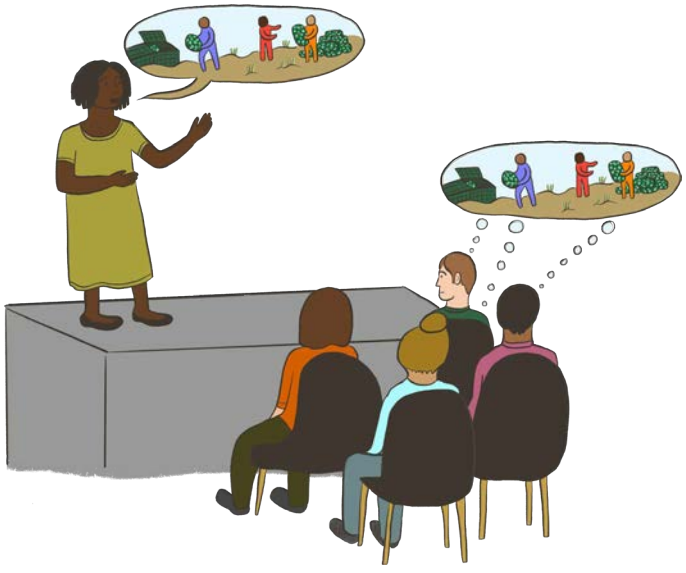
Need ideas for how to get involved in resilience related activities in your community? Explore some of the actions below and discover what others are doing in your community.

- Attend a community or City Council meeting - these meetings are usually open to the public and you can find out about them with the help of a trusted adult.
- Write a letter to one of your community's elected officials about climate change, resilience, or sustainability issues that need to be addressed.
- Form or join an environmental club at your school or in your community.
- Talk to your teacher about ways to make your school more sustainable including improving recycling, conserving water, and reducing energy use.



- Ask at your local science center what they are doing about climate change and how you can get involved.
- Meet your neighbors and ask if they are prepared for the hazards that your community commonly faces and help them if you can.

- Organize a group of your peers to talk about resilience issues in your community and take action to address them (some communities organize Youth Climate Summits to help with these efforts).
- Organize a group in your community to volunteer and plant trees (seek a trusted adult to help connect you to your city's forester, if it has one, or other expert that can help organize and guide this effort).
- Organize a group in your community to volunteer to pick up trash and clean up local parks.
- Find a project you would like to participate in through the Citizen Science section on page 23 of this book.
- Volunteer with a local environmental organization.
- Explore sustainability and resilience-related careers.



Pick an action you have seen in your own community or would like to see and briefly describe it.

Is there an action you can take? Make a plan here - what resources or help will you need? How long will it take to complete?

*Points- give yourself 10 points for developing the narrative and 10 points for making a plan for your own community. Put the total here:

/20

I, [enter your name] _____, commit to taking the above action to increase climate resilience in my community.

Activities to Continue to Learn and Explore

Science On a Sphere® https://sos.noaa.gov/

The Science On a Sphere is a room-sized, global display system that projects visualizations of planetary data onto a six foot diameter sphere to help illustrate Earth System science to people of all ages. It is available at over 170 centers around the world. There is also a free version available for your smartphone.

Let's explore some data visualizations! Download the SOS Explorer® app on your phone or tablet - https://sos.noaa.gov/sos-explorer/getting-sosx-mobile/

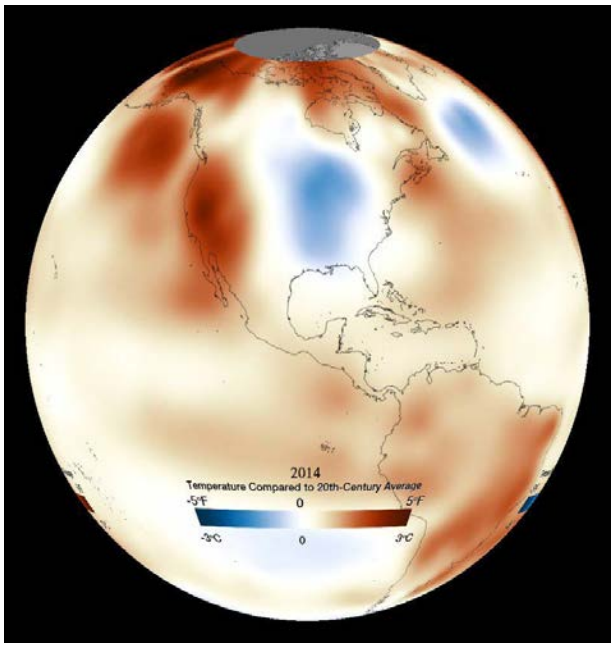
Open the app and navigate to the dataset called "Temperature Anomaly: Yearly," open it, and explore it. Watch the temperatures as time passes, zoom in and out, and move around the globe.

What patterns do you notice? How do the colors/ temperatures change over time?

Click the Tools icon in the bottom right and select Analyze. This allows you to pick any point on the globe and get the temperature anomaly/difference from average. Find your location generally and note the beginning and ending temperature anomalies here:

1880:_____ Present:_____

If they are different, why do you think they have changed?



What you are viewing is the difference in Earth's surface temperature from 1880 through the present compared to the 20th century average. By averaging data over long time spans, typically 30 years or more, these climate datasets can serve as reference points for comparing more recent points in time to what would have been expected. For example, is the temperature warmer or cooler this month than what would be expected from the average over North America?

Long term trends in average temperatures are warming - communities need to recognize this and other aspects of climate change and adapt to them, while doing their part to increase carbon storage and reduce greenhouse gas emissions.

The data presented in this visualization are from NOAA's National Centers for Environmental Information which uses data from thousands of land and ocean temperature stations around the world to determine temperature averages and differences (anomalies).

✱Points- Give yourself 10 points for completing this activity: ____/10

Citizen Science

Citizen science involves members of the public participating in data collection or other research activities that help identify new scientific questions and contribute to ongoing research. Citizen science sometimes goes by other names including community science, crowdsourced science, and public participation in scientific research. Volunteers can also contribute to outreach efforts that promote public understanding of science. NOAA has many opportunities for the public to help with research. A few are listed here. Check them out and consider collecting data and adding to research in your community.

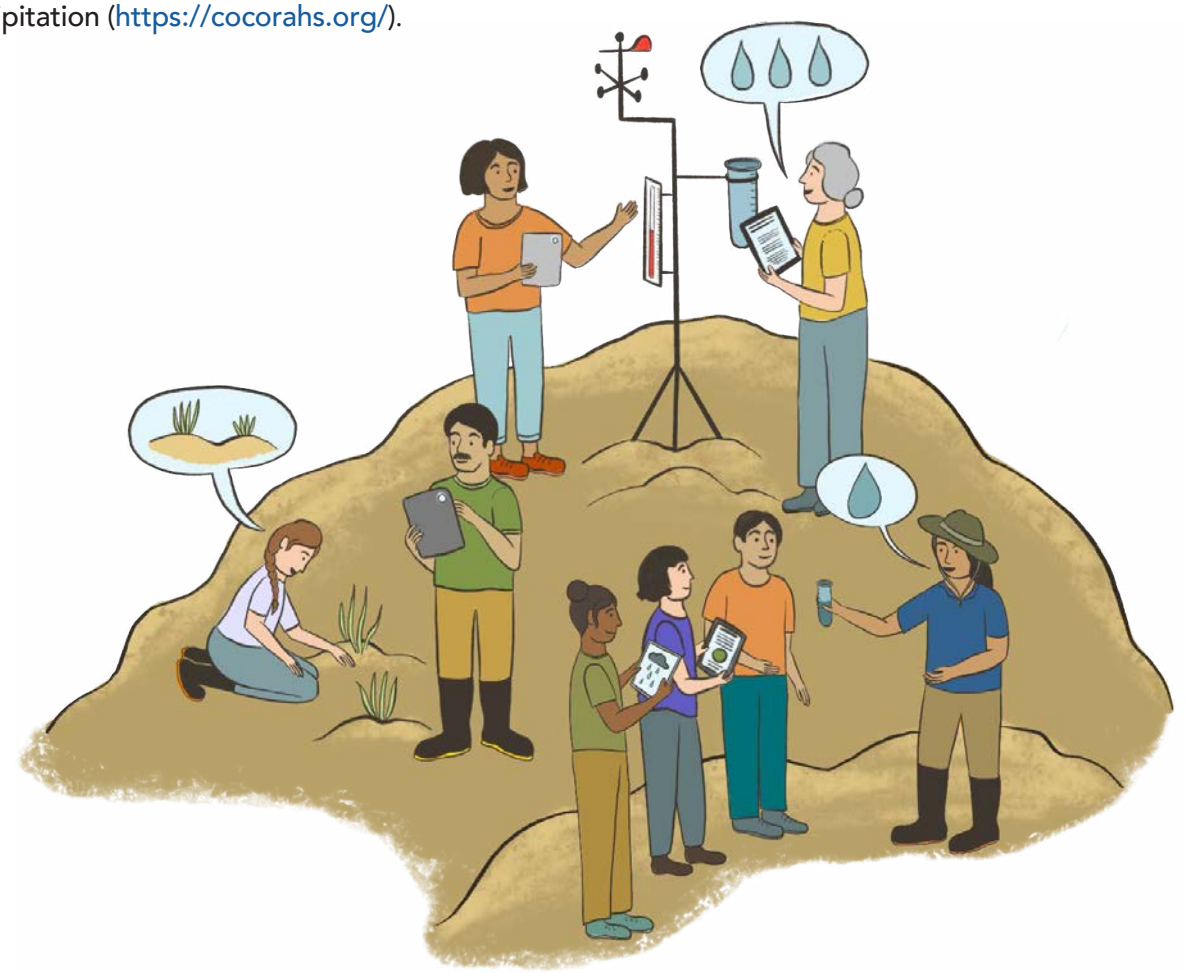
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) is a community-based network of volunteers that measure and map precipitation (https://cocorahs.org/).

Meteorological Phenomena Identification Near the Ground (mPING) is a project where volunteers use their smartphone or mobile device to collect weather information. You can help the NOAA National Severe Storms Laboratory collect public weather reports through a free app. (https://mping.nssl.noaa.gov)

These data help improve weather modeling and forecasting.

You can find out more about NOAA and citizen science here: https://www.noaa.gov/office-education/citizen-science-crowdsourcing

You can explore more projects here: https://www.citizenscience.gov/catalog/



Where Are You on the Steps to Resilience?

Add up your points and see what badge you earned!

U.S. Climate Resilience Toolkit https://toolkit.climate.gov/

The U.S. Climate Resilience Toolkit is a website that has information and resources about climate resilience. You can find resiliency experts, learn about future climate with the Climate Explorer tool, and learn about what other communities are doing to become resilient. The toolkit also outlines a framework that helps communities take steps to build resiliency. Applying the steps helps prepare communities to withstand weather and climate-related hazards.

The steps are:

1. Explore Hazards
2. Assess Vulnerability and Risks
3. Investigate Options
4. Prioritize and Plan
5. Take Action

Add up your points from each activity to see where you are in the Steps to Resilience and what badge you earn. You can cut out your badge and put it on a notebook cover or backpack, too!

My points:

Crossword (page 3)..... _____(10)

Exploring Your Community (page 5) _____(10)

Traditional Knowledge Activity (page 9) _____(15)

iSpy and Community Tour (page 11)... _____(20)

Environmental Justice Article (page 17) _____(15)

Telling a Story (page 21)..... _____(20)

SOS Temperature Activity (page 22).... _____(10)

Total _____(100)

Exploring Badge (0-20 pts)
You are off to a great start with the steps to resilience, exploring the hazards, and learning about what issues affect your community's health and sustainability. Continue your journey to resilience if you can!

Assessing Badge (21-40 pts)
You are well on your way with the steps to resilience, considering your community's vulnerabilities and where there is the most risk from identified hazards. To assess risk, you consider the probability of the hazard and the potential loss. This is an important step in your journey!

Investigating Badge (41-60 pts)
You are halfway through the steps to resilience, investigating options and solutions to the risks your community faces. You learn from how other communities have responded to similar issues in order to create a list of possible solutions. Keep up the good work!

Planning Badge (61-80 pts)
You are almost through the steps to resilience, prioritizing and planning how to implement solutions to the risks your community faces. You look at all the costs, benefits, and resources needed to plan for acting on possible solutions. Almost there!

Action Badge (81-100 pts)
Congratulations! You made it through the steps to resilience! You are acting on solutions, monitoring, and assessing your progress. You are a resiliency star!


EXPLORING
BADGE
NOAA

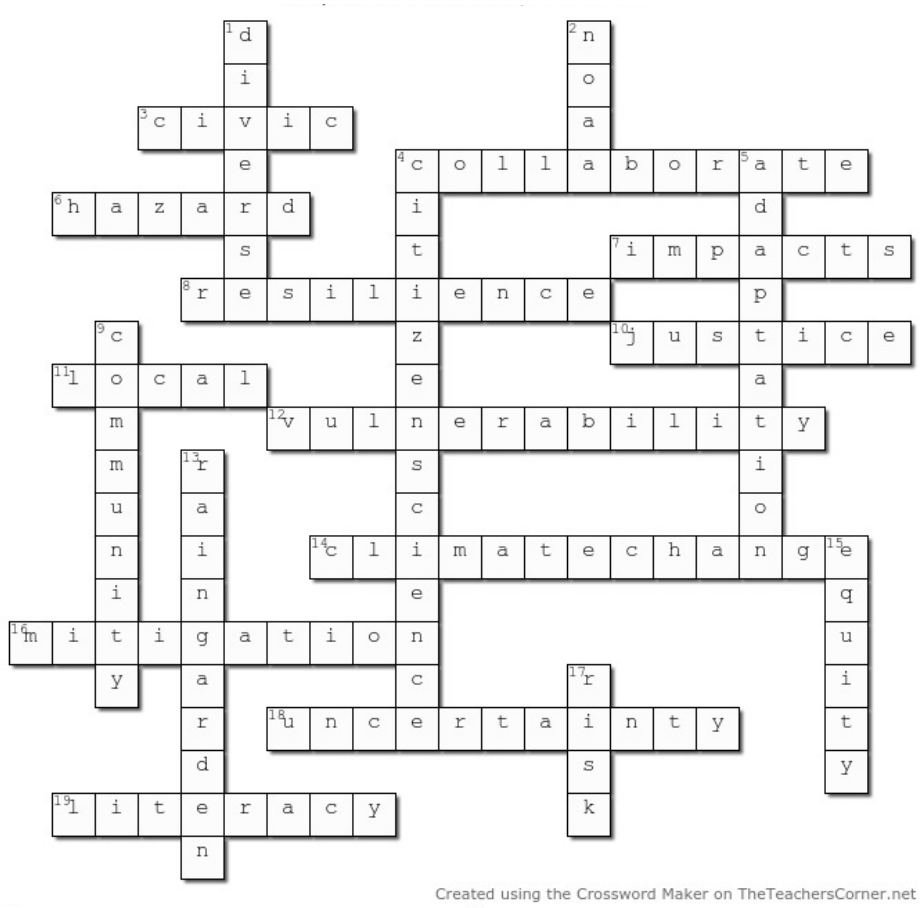

7
6
5
4
3
NOAA
ASSESSING
BADGE


INVESTIGATING
BADGE
NOAA


PLANNING
BADGE
NOAA
ACTION PLAN


ACTION
BADGE
NOAA
RESILIENCE

Answer Key


Created using the Crossword Maker on TheTeachersCorner.net

Dear users of this activity book,

You made it to the end! We hope that you learned more about your community and how you can make a difference to increase community resilience to climate change and extreme weather events. Making communities more resilient requires all of us working together. As first steps, it is important to learn what resilience means and then explore your own community and its resources and potential areas for improvement. The vision for a resilient community might look very different depending on where you live, but some of the elements contributing to resiliency likely already exist in your community. Using those elements and then adding more can help to increase resilience.

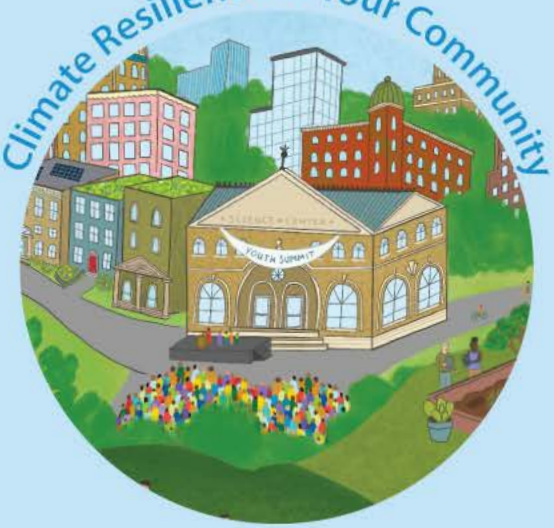
When thinking about building community resilience, it is critical to consider environmental justice and those who are most affected by climate change and environmental hazards in your community. Incorporating Traditional Ecological Knowledge also offers a complementary perspective that makes solutions more inclusive and respectful. With all of this in mind, it is possible to take action to make your community more resilient.

We encourage you to keep thinking about ways to make your community more resilient each day. The more people acting to increase resilience, the stronger and healthier our communities become.

Sincerely,

NOAA Office of Education & Nurture Nature Center

Climate Resilience in Your Community



Activity Book

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

THE NURTURE NATURE CENTER