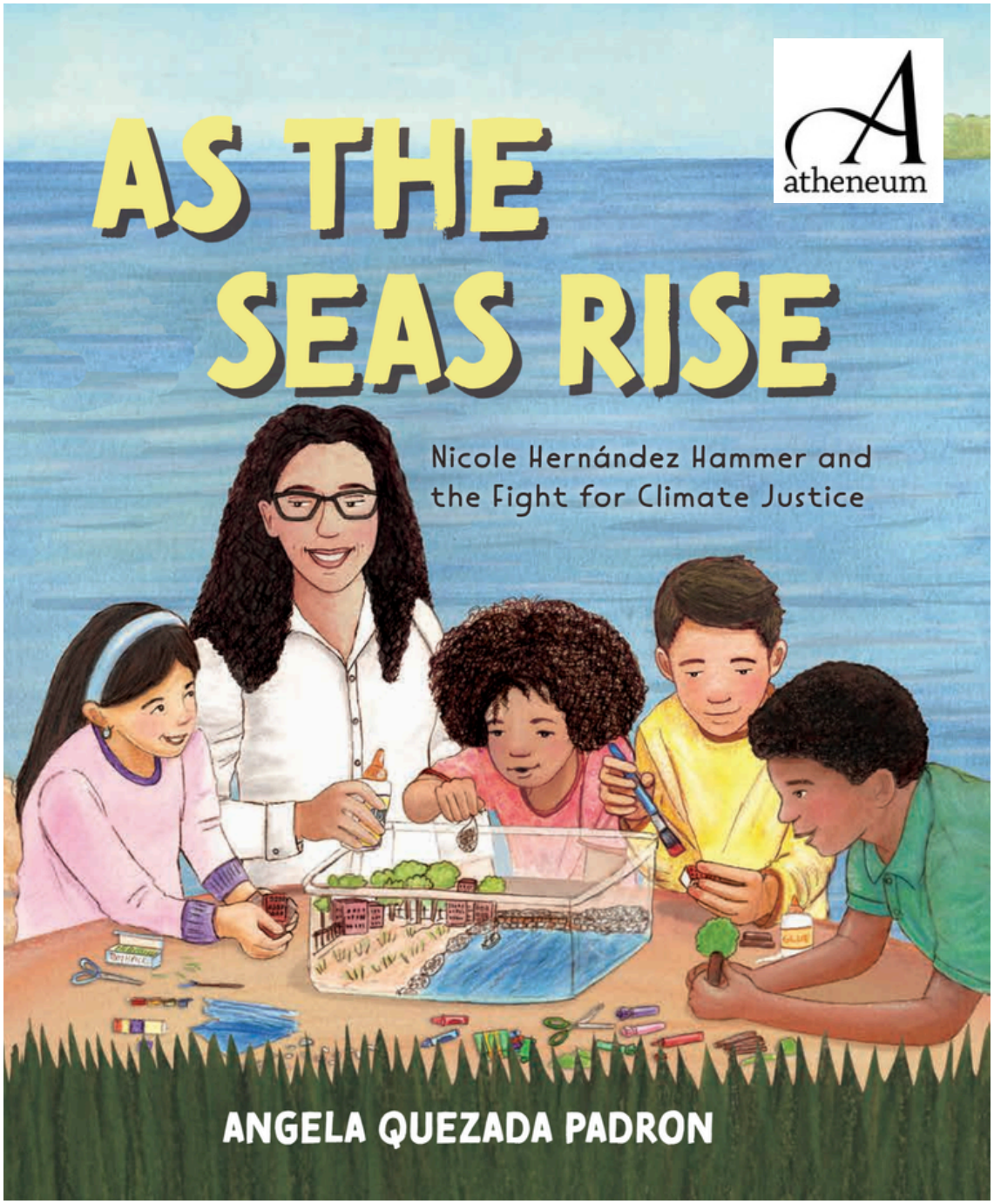
# Educator's Guide




**Written and designed by**
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# AS THE SEAS RISE

## Educator's Guide

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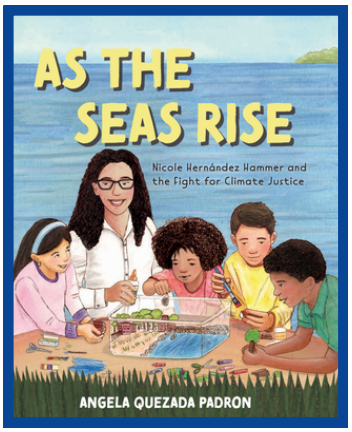
### Themes

advocacy, belonging, climate change, climate justice, collaboration, community, empathy, equity, fairness, human rights, immigrant, perseverance, resilience

"*As the Seas Rise* contains a powerful message about nature, the need for humans to change our ways, and the urgency for action. A useful addition to curricula about this topic, which can be paired with other books about activism." —*Booklist*

"The greatest strength of this book is the simple, straightforward language and clear example of climate justice activism. Multiracial communities are depicted. The text is sparse, but powerful. Highly recommended!" —*Youth Services Book Review*

### About the Book





atheneum Simon & Schuster CELEBRATING 100 YEARS

- Released June 11, 2024
- 48 pages
- ISBN: 9781665913942
- Grades: P - 3
- Ages: 4 - 8


This inspiring, lyrical picture book biography introduces environmental scientist Nicole Hernández Hammer, who was recognized by former first lady Michelle Obama at the 2015 State of the Union Address for her efforts to partner with vulnerable communities threatened by climate change.

As a baby, Nicole survived an earthquake in Guatemala. She grew up in Guatemala's beautiful jungles. Throughout her life, Nicole witnessed the power and wonder of nature. But she soon realized nature was in trouble. Her own community in Florida was struggling. And everyone needed to become resilient.

Readers will hear the message Nicole has spent her career sharing: As we look to the future, we can empower and protect our communities. But that will only be possible if we all work together—including the smallest of us.

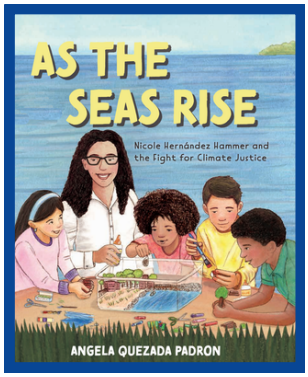
### About the Author-Illustrator

Angela Quezada Padron is a Latina author-illustrator who spent her childhood days writing stories and doodling on the garage walls of her New Jersey home and her summers visiting family in the Dominican Republic. She has been an educator for thirty years and has earned several college degrees, including an MFA in Illustration, MA in Curriculum and Instruction, EdS in Reading, BA in Art, and AA in Music. In addition, Angela is a freelance writer, illustrator, developmental editor, and consultant for educational publishers and literary organizations. When she's not working, Angela is an avid seashell collector, Broadway musical enthusiast, sports nut, aspiring recording artist, and admirer of the wonder of nature. Learn more about her at www.angelapadron.com.

# AS THE SEAS RISE

## Discussion Questions

Use these conversation starters to get kids thinking and learning as they read the book.




### Common Core State Standards

**READING**

**Key Ideas and Details:**

CCSS.ELA-LITERACY.CCRA.R.1
Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCSS.ELA-LITERACY.CCRA.R.3
Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

**Craft and Structure:**

CCSS.ELA-LITERACY.CCRA.R.4
Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

**Integration of Knowledge and Ideas:**

CCSS.ELA-LITERACY.CCRA.R.7
Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

**SPEAKING & LISTENING**

**Comprehension and Collaboration:**

CCSS.ELA-LITERACY.CCRA.SL.1
Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

**Presentation of Knowledge and Ideas:**

CCSS.ELA-LITERACY.CCRA.SL.4
Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

**LANGUAGE**

**Knowledge of Language:**

CCSS.ELA-LITERACY.CCRA.L.3
Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

**Vocabulary Acquisition and Use:**

CCSS.ELA-LITERACY.CCRA.L.4
Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

**WRITING**

**Production and Distribution of Writing:**

CCSS.ELA-LITERACY.CCRA.W.4
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

### Prereading

1. Before reading *As the Seas Rise*, help students identify the basic parts of a picture book: jacket, front cover, back cover, title page, spine, endpapers, and jacket flap. Identify the author-illustrator's name, and discuss the jobs authors and illustrators do.

2. Show students the cover and ask what they see. Read the title and subtitle. Then ask: *What do you think this story might be about? What are some clues in the title that might help you? In the illustrations on the front and back covers? On the book jacket?*

3. Turn to the title page, and ask students what they know about coral reefs. Elicit that coral reefs are underwater ecosystems for thousands of living species. Due to climate change and warmer seas, coral reefs are in danger of dying and bleaching, like the one in the illustration. Discuss how this could affect marine life over time.

4. Ask students what they know about climate change and climate justice. If need be, allow students to use dictionaries and/or websites to help them better understand these terms (see Additional Resources, page 35 of this guide). Complete the "Climate Change & Climate Justice" activity on page 5 of this guide to categorize information about these terms.

5. Conduct a picture walk and preview all the illustrations to generate excitement and allow students to get into the appropriate mindset. Complete the "Scavenger Hunt" activity (see p. 6 of this guide).

### During Reading

1. As you read, have students act out certain scenes, such as: earthquake (stomp their feet); El Quiché (animal sounds); Hurricane Andrew (sounds of blowing wind).

2. Ask: *How did Nicole feel while she lived in El Quiché, Guatemala? How did her feelings change when she moved to the United States?*

3. *How did Hurricane Andrew change Nicole's life?*

4. *What are some things Nicole did as a climate scientist and climate justice activist?*

5. *What did Nicole do to empower communities to protect themselves against climate change?*

# AS THE SEAS RISE

## Post-Reading Questions

1. Show students the front cover again. Then ask: *Now that you've read the book, why do you think the illustrator drew this cover?* After listening to students' ideas, explain that the cover image represents the idea of children working together to design a resilient community against climate change. Nicole is working with the children as they create a model of their ideal community to protect it from climate change with a living shoreline. The back cover depicts people building a living shoreline near their urban neighborhood, as if the children's model is coming to life. Many are placing bags of oysters which help prevent erosion of the shorelines. Symbolically, Nicole holds a bottle of glue that represents them sticking together and supporting one another.

2. *How did Nicole's connection to nature help her adjust to life in the United States? Use information from the text to support your answer.* (Possible response: When Nicole came to the United States, she had a hard time fitting in due to the different language and culture. She found ways to connect to nature, like climbing trees, collecting rocks, and investigating mud puddles. That helped her to feel more comfortable and to reconnect to her childhood in Guatemala.)

3. *How did Nicole's childhood affect her decision to become a scientist? Use information from the text to support your answer.* (Possible response: Nicole experienced an earthquake as a baby and a hurricane as a teenager. However, she also witnessed the beauty and wonder of nature. She wanted to understand more about the natural world and learn why storms like Hurricane Andrew were getting more intense.)

4. *How did Nicole's experiences as an immigrant help her in her job?* (Possible response: When Nicole moved to Miami, she felt a strong connection to her community where people spoke the same language and came from similar cultures. When she became a scientist, she wanted to work with people from those same communities to make sure they could protect their homes and themselves against climate change.)

5. *Why did Nicole think it was important for people to tell their stories about how climate change was affecting them?* (Possible answer: Some people may not have believed what was really happening. If others heard how people were suffering from the effects of climate change, they would understand the situation better and want to partner with them to make their lives better.)

6. *What are some themes in the book?* (Possible answers: People should listen to each other and work together to help one another and our planet. Speak up for fairness and equality.)

7. *What is the author's point of view? How does the author call us to action at the end of the book?* (Possible answer: The author feels it's important to talk about how climate change affects people, not just the planet. She believes there's still more work to be done to combat climate change and achieve climate justice. If we all work together, we can make a difference.)

# AS THE SEAS RISE

## Post-Reading Activities

1. Review the back matter spread with students. Point out the page border and symbols next to each paragraph. Explain that the designs are based on indigenous Mayan symbols, which represent Nicole's Mayan heritage from Guatemala. Have students look up the meanings for the different symbols (see Additional Resources, page 35 of this guide).

2. Point out the boldface words in the back matter. After reading the spread, have students provide definitions of the terms in their own words based on information in the book and in the back matter.

3. Have students work in pairs to compare and contrast two spreads in the book using a Venn Diagram (see page 7 of this guide). Model first by using one of these sets of pages: front end page of the rough seas/back end page of the mangrove tree and oysters that help protect the shorelines; earthquake/El Quiché; not fitting in/connecting to nature; Miami/Hurricane Andrew; working in the community/protesting.

4. Have students complete the "Sequence of Events" activity on page 8 of this guide. Then have students work in pairs to summarize the book in their own words.

5. Explain that a compound word is a word made from two smaller words, such as *shoreline*, *seawater*, and *earthquake*. Have students identify compound words in the story. Then have them complete the "Compound Words" activity on page 9 of this guide.

6. Point out the bold words in the text. Ask: *Why do you think the author put these words in bold?* (Expected response: For emphasis.) Discuss the term *connotation* and explain that certain words may be used by authors to invoke additional meaning or emotion. Have students think of synonyms for the bold words. Then substitute them into the text and reread those pages. Have students evaluate the connotation of each word. Then have students complete the "Vocabulary Activities" on page 10 of this guide.

7. Discuss the term "cause and effect," or why something that happens (cause) results in something happening (effect). Have students complete the "Cause and Effect" activity on page 11 of this guide, then turn to a partner to explain their answers.

# AS THE SEAS RISE

## Climate Change & Climate Justice

**Directions:** Cut and paste the terms below and place them in the correct category.

| Climate Change | Both | Climate Justice |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Challenge!** Why is it important to talk about climate justice when we talk about climate change?

| | | |
|---|---|---|
| **affects all people** | **addresses equity** | **affects the food we eat** |
| **extreme weather** | **addresses human rights** | **temperature changes** |
| **affects certain communities** | **affects sea levels** | **addresses racism** |
| **affects people's health** | **affects animal habitats** | **important to discuss** |

# AS THE SEAS RISE

## Scavenger Hunt

**Directions:** Check the box as you find each item in the book.

☐ How many dragonflies are in the book? _____

☐ The national bird of Guatemala is the quetzal. Can you find the quetzal?

☐ Nicole Hernández Hammer attended the University of South Florida. The school's mascot is a bull, which is the same animal as the author's favorite children's book character, Ferdinand the Bull. Can you find Ferdinand the Bull?

☐ Nicole also attended Florida Atlantic University, whose mascot is the owl. Can you find the owl?

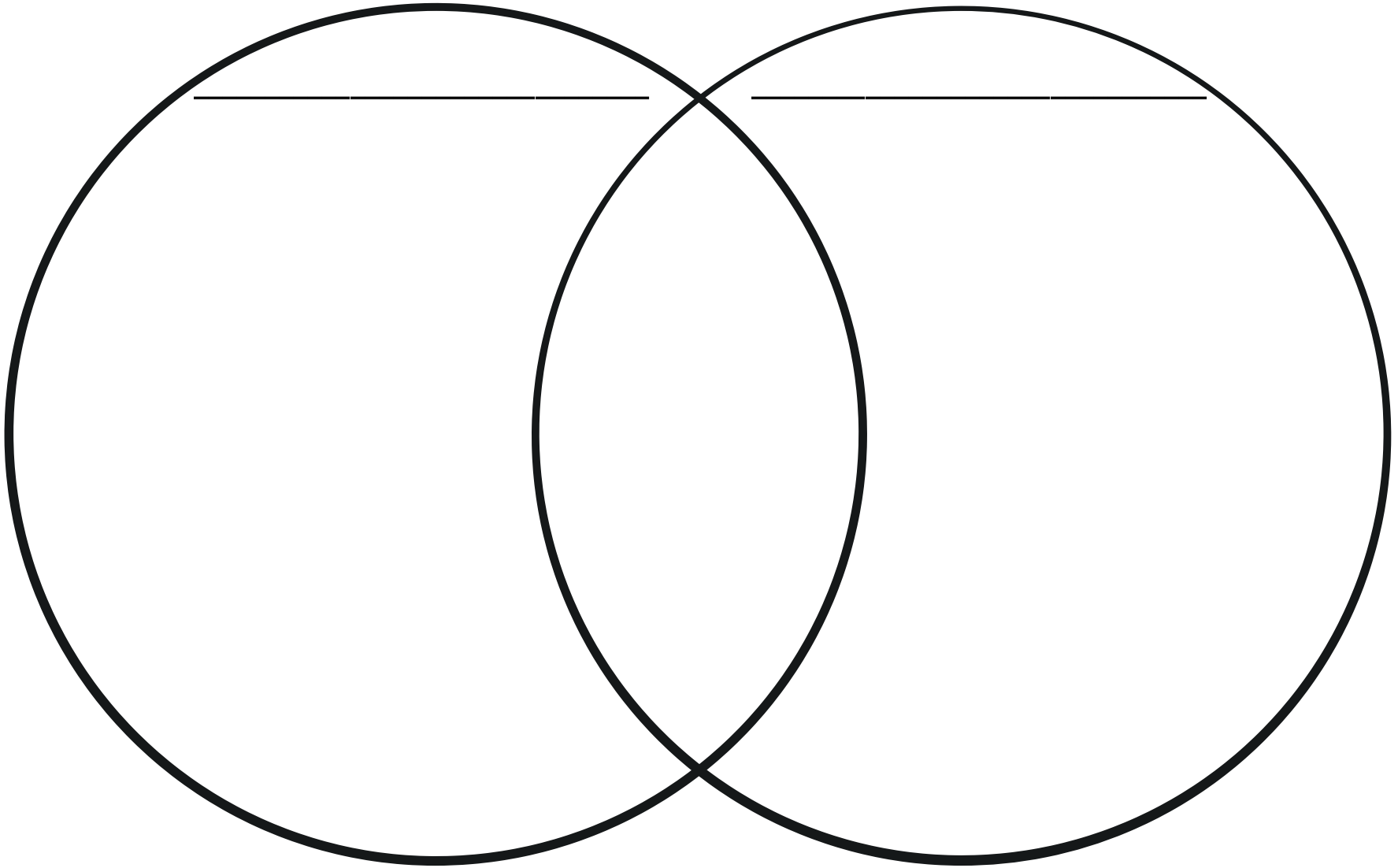
☐ The author's father is from the Dominican Republic, and Nicole's father is from Cuba. Can you find the Cuban flag and the Dominican flag?

☐ Nicole's mother was from Guatemala. She was a descendent of the ancient Mayan people. How many of these Mayan symbols can you find in the back matter?

# AS THE SEAS RISE

## Compare and Contrast

**Directions:** Choose two different scenes from *As the Seas Rise*. Use the Venn Diagram to show how the events are the same and different.

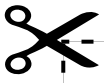


# AS THE SEAS RISE

## Sequence of Events

**Directions:** Cut and paste the events of Nicole's life from *As the Seas Rise* in the correct order.

| |
|---|
| **First,** |
| **Next,** |
| **Then** |
| **After that,** |
| **Lastly,** |



Nicole and her family moved from Guatemala to the United States.

Nicole met President Barack Obama and First Lady Michelle Obama.

Nicole and her mother escaped an earthquake in Guatemala City.

Nicole went to college and studied to become a scientist.

When Hurricane Andrew struck, Nicole's home was destroyed.

# AS THE SEAS RISE

## Compound Words

**Directions:** Draw a line from a word in the left column to a word in the right column to create compound words. Then write the compound words on the lines below. (Hint: All the words are found in the book!)

| | |
|---|---|
| front | ground |
| sea | hood |
| under | line |
| neighbor | quake |
| earth | water |
| dragon | flies |

_____ _____

_____ _____

_____ _____

# AS THE SEAS RISE

## Vocabulary Activities

**Directions:** Read these words from *As the Seas Rise*. Using a dictionary or thesaurus, write at least one synonym and one antonym for each word.

| Word | Synonym | Antonym |
|---|---|---|
| powerful | | |
| wondrous | | |
| beautiful | | |
| destructive | | |
| important | | |

**Directions:** Read the words below. Underline the base words. Then circle any prefixes and suffixes.

| | |
|---|---|
| re = again<br>un = not<br>mis = wrong | able = ability to do something<br>ness = state or condition<br>ist = a person who does, makes, or practices something<br>tion = state, condition |

renewable unfairness scientist

misinformation activist adaptation

**Challenge!** How do the prefixes and suffixes change the meaning of each base word?

# AS THE SEAS RISE

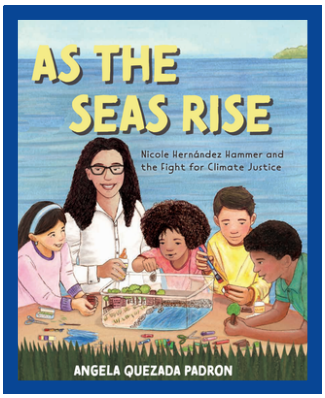
## Cause and Effect

**Directions:** Draw a line to connect the cause from the left column to its effect in the right column.

| Cause | Effect |
| --- | --- |
| Nicole didn't speak English. | Nicole's home was destroyed. |
| Aquifers filled with seawater. | She studied science and researched about climate change. |
| Hurricane Andrew struck. | In the U.S., Nicole didn't feel like she could fit in. |
| Nicole wanted to know why storms were getting stronger. | The seawater underground crept onto the streets. |
| Sea levels rose in Florida. | Streets flooded on rainy days and sunny days. |

# AS THE SEAS RISE

## Cross-Curricular Activities




### Common Core - Math

**Represent and Interpret Data** - 1.MD.C.4, 2.MD.D.10; 3.MD.B.3

**Work with time and money** - 2.MD.C.8

**Operations and Algebraic Thinking** - 3.OA.D.8

### Next Generation Science Standards

**ESS2 Earth's Systems**
Use and share observations of local weather conditions to describe patterns over time.

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Analyze and interpret data from maps to describe patterns of Earth's features.

### English Language Learners - WIDA

**Language for Social and Instructional Purposes**
English language learners communicate for social and instructional purposes within the school setting.

**Language for Language Arts**
English language learners communicate information, ideas and concepts necessary for academic success in the content area of language arts.

**Language for Mathematics**
English language learners communicate information, ideas and concepts necessary for academic success in the content area of mathematics.

**Language for Science**
English language learners communicate information, ideas and concepts necessary for academic success in the content area of science.

**Language for Social Studies**
English language learners communicate information, ideas and concepts necessary for academic success in the content area of social studies.

### Math & Social Studies

1. Discuss different types of graphs (pictograph, bar, line, pie chart, etc.) and what type of data each shows. Explain that a line graph shows change over a period of time, so this type of graph is good to show change in sea level rise over time. Provide each student with a copy of "Sea Level Rise" on page 14 of this guide. Have them study the graph before answering the questions.

   You may also wish to distribute sheets of graph paper for students to create their own line graph of other data, such as sea levels from 2020 to present day or ocean temperatures over time. (See links in Additional Resources on page 35 for information.)

2. Provide 3-5 copies of "Climate Change Survey" (page 15 of this guide) to each student to conduct surveys. Interviewees could be another student, family member, or member of the community (one response per person). After all data has been gathered and calculated, divide students into groups by question and have them represent the data in either a pictograph, bar graph, or pie chart.

3. Discuss the term *eco-friendly*. Explain how this term is used to describe products and practices that are intended to have less impact on the environment and to help reduce climate change. Pass out a copy of "What's the Difference?" (page 16 of this guide) to each student. Have students view local grocery store fliers or websites to record the price of each commonly used product and eco-friendly product. Then have students calculate the differences. Have students discuss in pairs or groups: *Do you believe people would be willing to pay more in order to use more eco-friendly materials? Why or why not? What effects would this have on animal habitats and the planet?* Then have students think about the stores, restaurants, and places that they and their family go to. As a class, write letters to their family members and managers of these places to persuade them to use more eco-friendly containers and products. Be sure students explain why this is important and how this change could help us and the Earth.

4. Refer back to the first two spreads of *As the Seas Rise* when Nicole lived in Guatemala. Pass out copies of "Nicole's Home" on pages 17-18 of this guide. Show students where Guatemala is located on the world map and in reference to the United States. Then show students where Guatemala is in Central America. Have students read the short paragraph about Guatemala, the quetzal, and the flag, then color in the page.

# AS THE SEAS RISE

## Cross-Curricular Activities

### Science

1. Read the first two paragraphs of the back matter spread about thermal expansion and melting glaciers that contribute to climate change. Conduct the "Melting Ice" experiment on page 19. Have students complete the Lab Report on page 20 of this guide and discuss the findings as a class.

2. Have students track the weather in their neighborhood over a month's time (see page 21 of this guide). Compare the month's weather to the typical climate for their neighborhood at this time of the year and make note of any differences that may or may not indicate climate change is occurring.

3. Discuss how trees and living shorelines help combat climate change by absorbing carbon dioxide and producing oxygen for cleaner air, absorbing water to avoid flooding, and providing shade to help cool neighborhoods, especially in urban areas with lots of concrete buildings. Have students evaluate the trees and living shorelines in their community. Then have students write letters to their local, state, and federal legislators to advocate for the benefits of having more trees and living shorelines in their neighborhood.

4. Discuss the difference between the terms *recycle*, *reduce*, and *reuse*. Have students share experiences recycling, reducing, and reusing items and where they've seen receptacles in their neighborhoods, such as clothes donation boxes, and plastic and paper recycling bins outside stores. Then have students brainstorm items that fit into each category and complete the activity sheets on pages 22-23 in this guide.

5. Review the term *eco-friendly* (items that are safer for the Earth). Some examples are reusable and recyclable materials, biodegradable items (items that can break down, or decompose, naturally), and palm-oil-free products (when oil palm trees are cut down, many animal habitats are destroyed.) Have students complete the "Eco-Friendly" activity on page 24 of this guide to choose the most eco-friendly products.

6. Have students work in pairs or groups to brainstorm a list of future careers in environmental science and social justice. Hold a career day for students to dress up like a science professional and present information to the rest of the class about their career. See pages 25-26 of this guide for activity sheets.

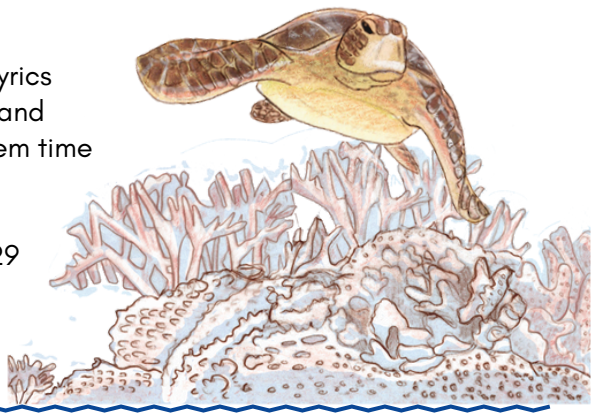
### Art and Music

1. Provide each student with a copy of "Save the Dragonflies!" on page 27 of this guide. Read the passage together, using the internet to show images of different dragonfly species. Pass out crayons, colored pencils, or markers for students to color in the dragonflies on their sheet.

2. Have students work in pairs or groups to brainstorm ideas to make their community resilient to climate change. Students can create 3D dioramas like the characters on the cover, or students can use page 28 of this guide to draw a picture.

3. Have students work in pairs or groups to create an original song or rap lyrics about climate change or climate justice. Encourage them to use words and terms that they learned from *As the Seas Rise*. If students wish, allow them time to present their song or rap to the class.

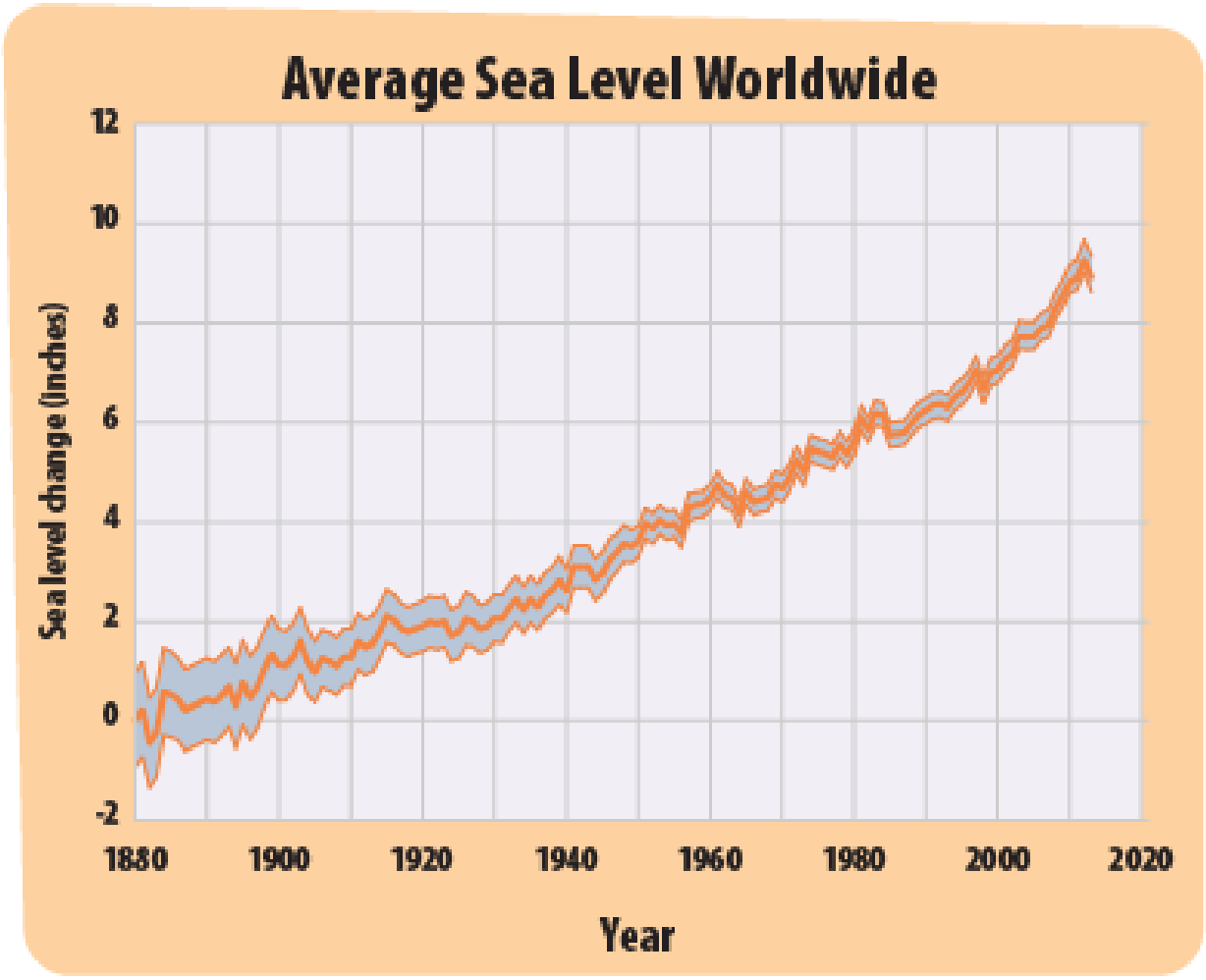
4. Provide each student with a copy of "Speak Out for Change" on page 29 of this guide. Have students design a poster they would use at a rally against climate change or for climate justice. Students could also create larger posters on pieces of construction paper.



# AS THE SEAS RISE

## Sea Level Rise

**Directions:** Look at the graph below. Then answer the questions.




Source: A Student's Guide to Global Climate Change (archive.epa.gov, 2016)

1. According to the graph, have sea levels been increasing or decreasing? _____

   How do you know? _____

2. About how many inches did sea levels rise between the years 1900 and 2000? _____

3. Based on this graph, what do you think the line would look like if the graph showed sea level rise in 2040? Explain your answer. _____

_____

# AS THE SEAS RISE

## Climate Change Survey

**Directions:** Complete one survey for each person you speak to.

1. What things do you recycle?

☐ plastic bottles ☐ plastic bags ☐ aluminum cans ☐ glass

☐ cardboard ☐ paper ☐ batteries ☐ clothes

☐ other_____ ☐ I don't recycle.

2. Does your city or town have a recycling program? ☐ yes ☐ no ☐ I don't know.

3. When you go shopping, which of these do you usually use?

☐ plastic bags ☐ paper bags ☐ reusable bags ☐ boxes/crates

4. When you drink water, which of these do you usually drink from?

☐ plastic bottles ☐ reusable bottle ☐ canned water ☐ a glass

5. Which best describes your neighborhood?

☐ rural ☐ suburb ☐ coastal town ☐ urban (city)

6. In the last year, have you experienced any of these extreme events?

☐ hurricane ☐ tornado ☐ flooding ☐ earthquake

☐ drought ☐ extreme heat ☐ extreme cold ☐ wildfires

☐ blizzard ☐ other _____ ☐ none

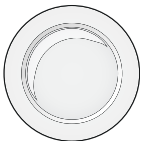
7. Does your community have a cooling center? ☐ yes ☐ no ☐ I don't know.

8. Do you think your community is protected enough by climate change? ☐ yes ☐ no

# AS THE SEAS RISE

## What's the Difference?

**Directions:** Use grocery store flyers and websites to determine the price of each item. Calculate the difference in price. Then answer the discussion questions.




| Commonly used product | Biodegradable/ Compostable product | Price difference |
|---|---|---|
| $ _____ | $ _____ | $ _____ |
| $ _____ | $ _____ | $ _____ |
| $ _____ | $ _____ | $ _____ |
| $ _____ | $ _____ | $ _____ |
| $ _____ | $ _____ | $ _____ |
| | **Total price difference** | $ _____ |

### Discussion Questions

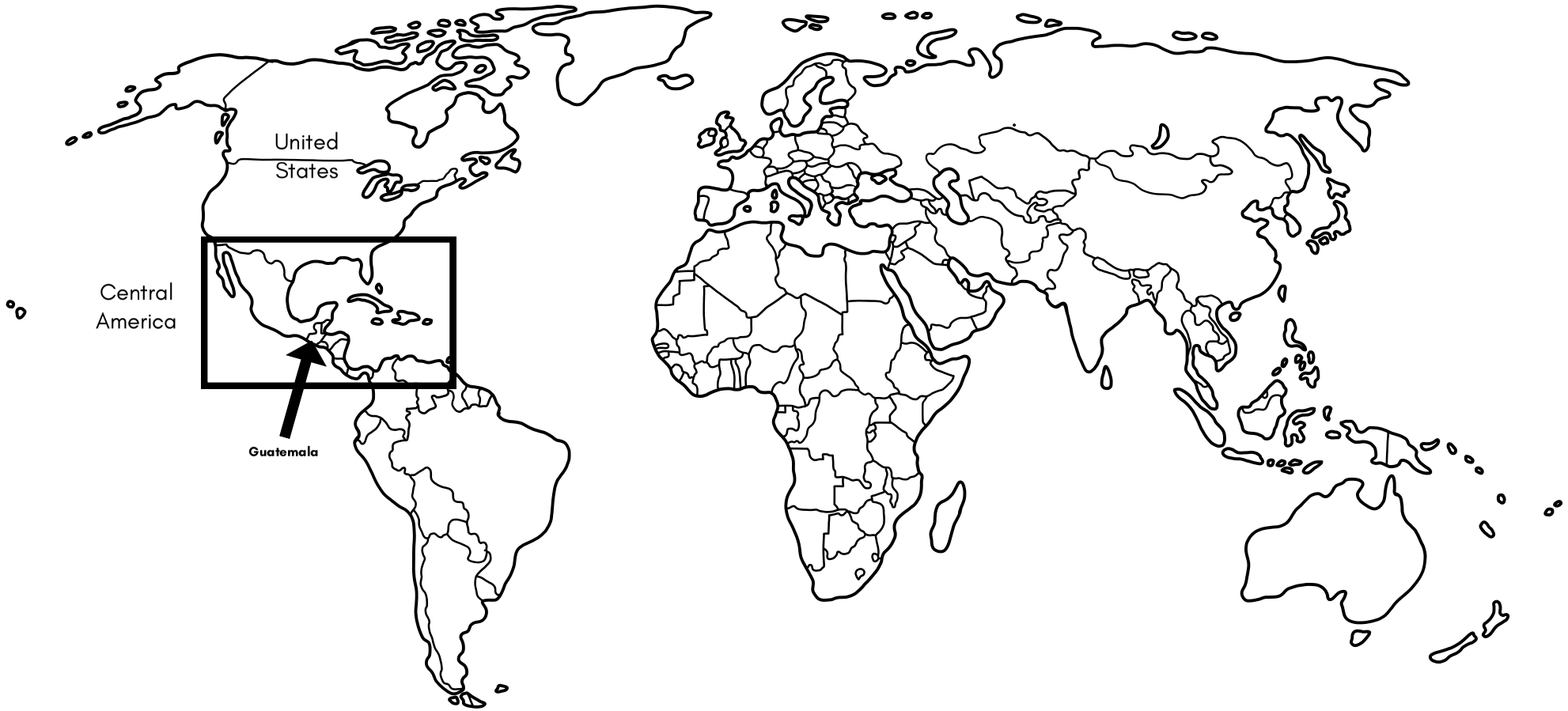
1. Do you believe people would be willing to pay a higher price in order to use more eco-friendly materials? Why or why not?

2. What effects would using biodegradable and compostable products have on animal habitats and the planet?

3. Write letters to your family members and managers of local businesses to persuade them to use more eco-friendly containers and products. Be sure to explain why it's important and how this change could help us and the Earth.

# AS THE SEAS RISE

## Nicole's Home

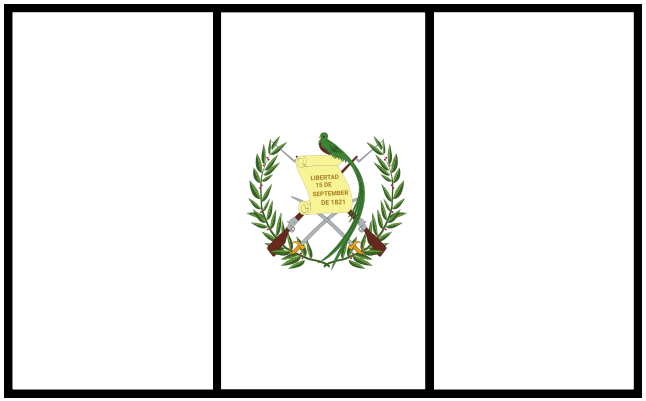


# AS THE SEAS RISE

## Nicole's Home

Nicole Hernández Hammer was born in Guatemala, a country located in Central America. The national bird of Guatemala is the quetzal and appears on the national flag. Quetzal is also the name of the country's currency! Color in Guatemala **red** on the map. Then color in the quetzal, coin, and flag.





# AS THE SEAS RISE

## Melting Ice

**Overview/Background:**

Glaciers and ice sheets are very large pieces of ice on Earth. They are made of fresh water that comes from rain or snow. Because of their large size, glaciers and ice sheets move very slowly. When it snows or rains, glaciers can collect more water and grow. When it's hot outside, glaciers will melt and break off large pieces of ice called icebergs into the sea. The hotter the temperature, the faster the ice melts and the more water is added to the oceans. This is partially why sea levels are rising.

**Materials:**

- Two medium-sized plastic food storage containers (about 4 inches by 7 inches)
- Clay or playdough (enough to fill 1/3 of the container about 1.5 inches high) (represents land)
- Ice cubes (represent the glaciers)
- Water (represents the ocean)
- Blue food coloring (optional)
- Marker
- Ruler

**Procedures:**

1. Ask students what they know about glaciers and sea level rise and what they want to know. Record their questions on the Lab Report. As a class, research online to learn what glaciers look like and where they are located on Earth. Tell students they will create one model to sit in the sun and one to sit at room temperature.
2. Ask students to record their predictions (hypothesis) on the Lab Report about what will happen as the ice melts over time in each model.
3. Have students write the procedures on their Lab Report: Press the clay into one end of each plastic container until it is about 1.5 inches high and fills about one-quarter of the container.
4. Place the ice cubes on top of the clay, layering as many ice cubes as possible.
5. Pour water into the empty side of the container. Do not go above the top of the clay. Add one drop of blue food coloring for added effect.
6. Draw a line on each container at the water level with the marker.
7. Let one container sit in the classroom and one out in the sun, having students come back every 10-15 minutes and observing the change in the water level until all the ice is melted.
8. Once the ice has completely melted, mark the new water lines with the marker. Record the time and use a ruler to measure the difference from the starting line to the finished line.
9. Have students record their observations. Ask: *What happened to the ice in each container? Which one melted the ice faster? What changed about the water and the land?*
10. Ask students questions about their initial predictions about the ice and the result of the experiment, such as *How was the result of the experiment different from what you thought would happen? How was it the same? What can you conclude from this experiment?*

Based on the PBS Sea Level Rise Experiment - https://www.pbs.org/parents/crafts-and-experiments/what-makes-the-sea-rise

# AS THE SEAS RISE

## Sea Level Rise - Science Lab Report

Question

?

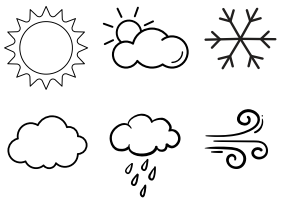
Hypothesis

Materials

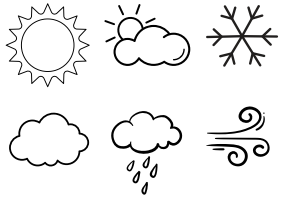
Procedure

Observation & Results

Conclusion



# AS THE SEAS RISE



## My Neighborhood Climate

**Directions:** Draw a picture to represent the weather in your neighborhood each day for a month. Compare your observations with the typical climate for your region at this time of the year. What is the same? What is different?

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |

# AS THE SEAS RISE

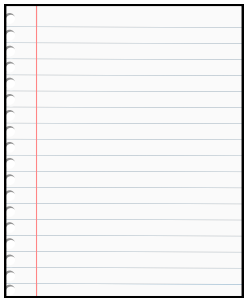
## Reduce, Reuse, Recycle

**Directions:** Circle the pictures of things we can reduce. Put a triangle around things we can reuse. Put a box around things we can recycle. (Note: Some pictures will have more than one answer.)








# AS THE SEAS RISE

**Directions:** List or draw additional pictures of things that everyone can recycle, reduce, and reuse.

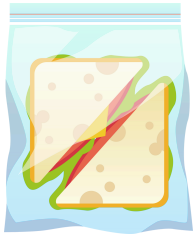
| Reduce | Reuse | Recycle |
| --- | --- | --- |
| | | |

# AS THE SEAS RISE

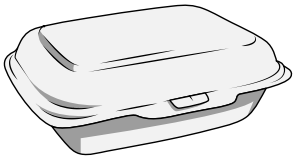
## Eco-Friendly

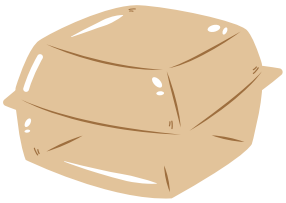
**Directions:** For each question, circle the picture that is more eco-friendly.
Be ready to explain why you made that choice.

1. Plant-based plastic or regular plastic baggies?

2. Styrofoam or natural fibers containers?





3. Plastic water bottle or aluminum water can?

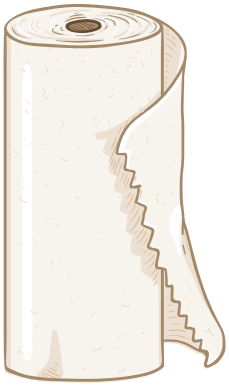


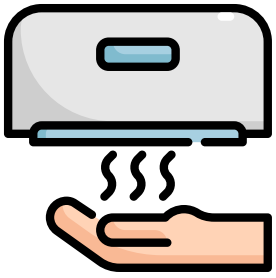
4. Palm-oil-free shampoo or regular shampoo?



5. Reusable bag or plastic bag?

6. Paper towels or air dry?





# AS THE SEAS RISE

## Future Careers in Science

**Directions:** Nicole works as a scientist. Imagine you could be a scientist too. What type of science career would you choose? Draw yourself as a scientist working in your career field. Explain what you do and how your job could impact your community and the world.

**I am a...**

**In my career, I...**

**My career impacts my community and the world because...**

# AS THE SEAS RISE

## Future Careers in Science

**Life Sciences**

- Biologist
- Biomedical scientist
- Botanist
- Educator
- Epidemiologist
- Herpetologist
- Marine biologist
- Microbiologist
- Neuroscientist
- Physician
- Veterinarian
- Zoologist

**Applied Sciences**

- Aerospace engineer
- Aeronautical engineer
- Biomedical engineer
- Chemical engineer
- Civil engineer
- Computer engineer
- Educational technologist
- Electrical engineer
- Engineering technician
- Forensic science technician
- Mechanical engineer
- Petrochemical engineer
- Robotics engineer

**Natural Sciences**

- Archaeologist
- Astronaut
- Astronomer
- Biochemist
- Biologist
- Chemist
- Ecologist
- Environmental scientist
- Forester
- Geographer
- Naturalist
- Oceanographer
- Paleontologist
- Pathologist

**Earth Sciences**

- Geographer
- Geologist
- Geoprofessions
- Petroleum geologist

**Physical Sciences**

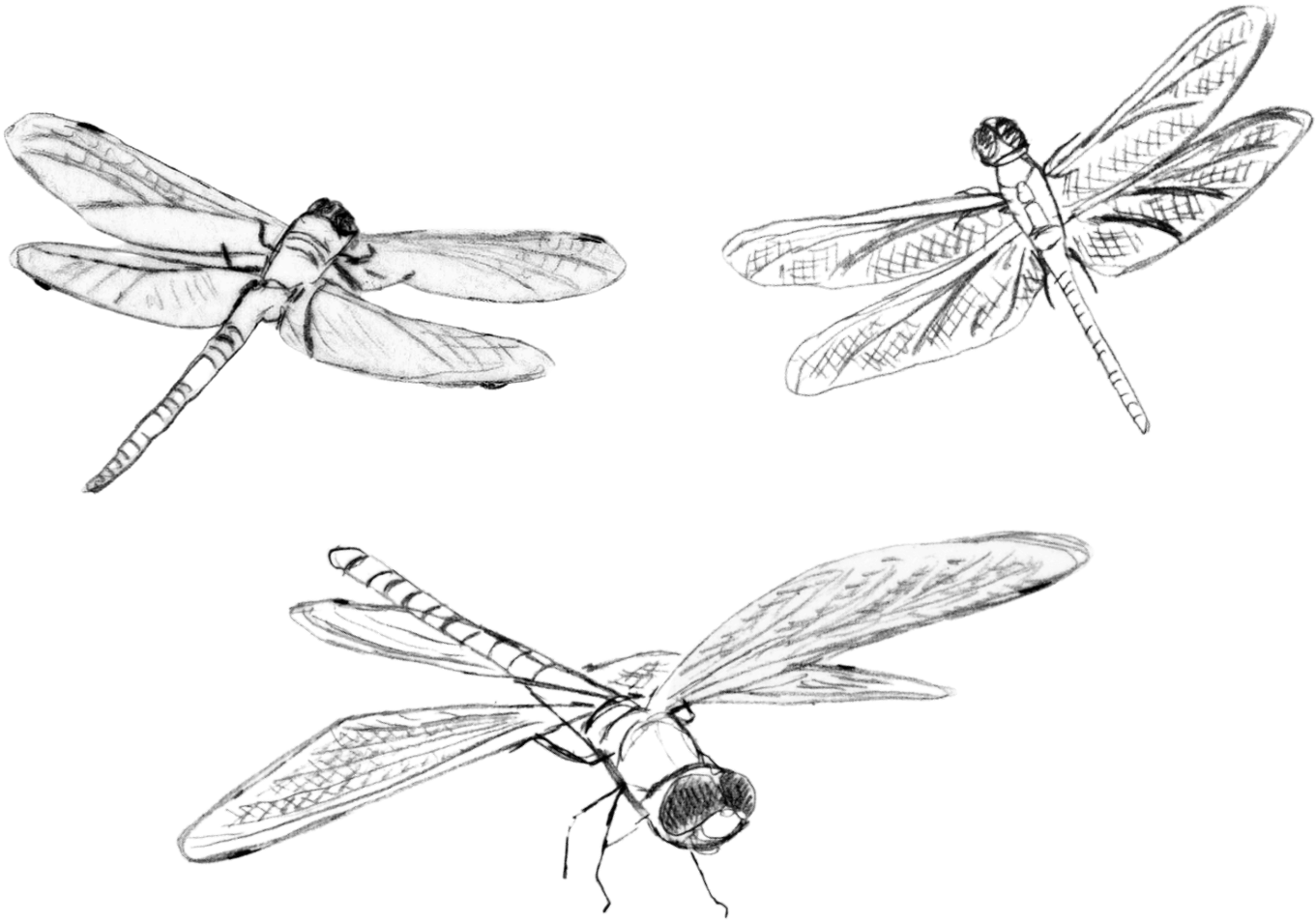
- Chemist
- Physicist

# AS THE SEAS RISE

## Save the Dragonflies!

When Nicole was a child, she used to go outside and let dragonflies tickle her face. But that's not the only reason dragonflies appear in *As the Seas Rise*. They are a symbol of how climate change is affecting the food chains and habitats of all of Earth's creatures, including dragonflies. As Earth's temperature rises, more water evaporates. This can decrease the water levels in wetlands where many species of dragonflies live and lay their eggs. Also, climate change is impacting the lives of smaller insects that dragonflies eat for food. Scientists have noticed that in some warmer climates, dragonflies' wings are drying out and losing their color.

**Let's imagine a world without climate change! Color the dragonflies below.**



# AS THE SEAS RISE

## Your Community

**Directions:** Draw a picture of your community addressing climate change and climate justice.

- How is climate change already affecting your community?
- How is your community addressing climate change now?
- What other resources or services does your community need to be resilient against climate change?

**You may wish to use some of the terms below to help you describe your community drawing.**

| | | | |
|---|---|---|---|
| living shoreline | sunny day flooding | cooling center | aquifer |
| sea level rise | resilient | heat island effect | partner with |

# AS THE SEAS RISE

## Speak Out for Change

**Directions:** Design a poster to persuade others to fight against climate change or to promote climate justice.

# AS THE SEAS RISE

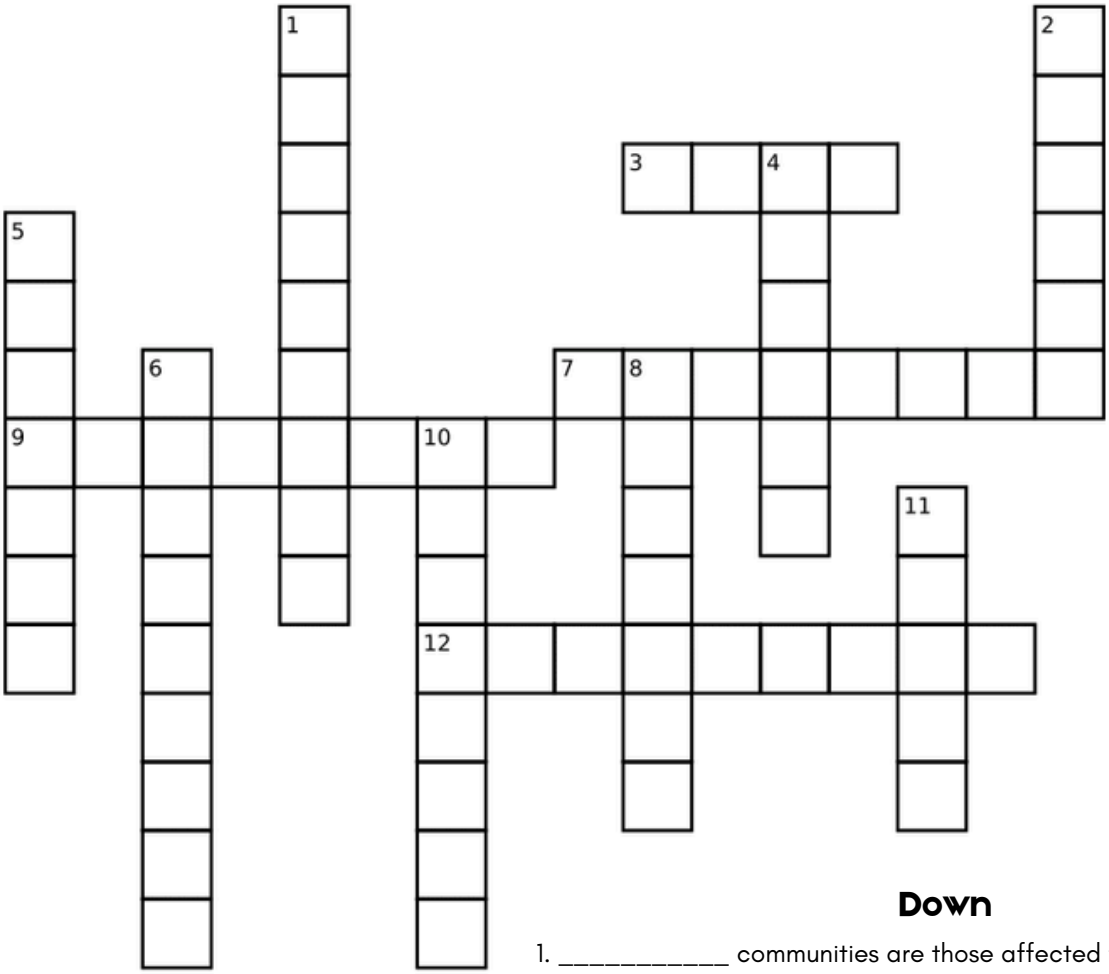
## Word Search

R Z E V Y N Y Y I P O Y O S P O B L D K
N C A U F A Q Z H D M Z B Q E R E U I V
Z U F I E C S C I E N T I S T G C Q C Q
T T L M P R E U S E K G D S A A L V I G
V L L U H U G X T N A T U R E N I R S Z
G Y K M M D Q Q K G C I T H A I M A H I
F S W Q A I L V T Y U F F K X Z A Q X A
S Z S D D J D R H I V R L S H E T K T R
F Q Y V A T L M O E I O F X A D E X Q E
Y B G H P C F Y H B R U T M T R C I O C
K W U Z T O T F S Y G O O B C R H M O Y
D P A W I J A U E O D P D R T R A C B C
Z H T R R Z H U R R I C A N E C N N R L
Q K E W A E D R A G O N F L Y R G T D E
N M M W M N E G H T Y A G O L L E U Y T
G F A T T Z S E A L E V E L R I S E T M
R K L F Y C E Y N F E J B B N L I M X A
H Q A N T H E R M A L E X P A N S I O N
C M E U L T M J T D C J R E D U C E C W
X H F O S S I L F U E L S D A E P J A Q

adapt
dragonfly
nature
hurricane
climate change
Guatemala
sea level rise
reduce
reuse
recycle
scientist
organized
thermal expansion
fossil fuels

# AS THE SEAS RISE

## Crossword Puzzle




### Across

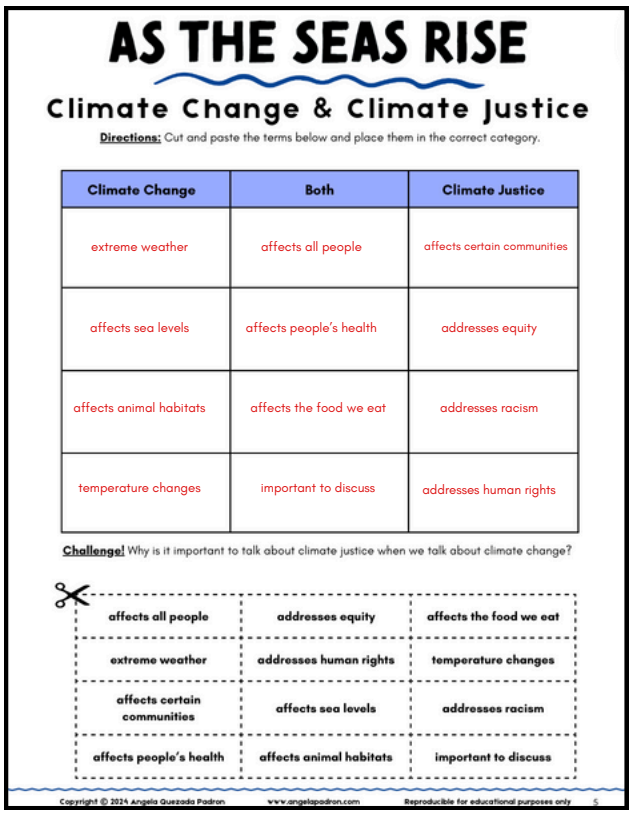
3. The _____ Stream is a strong ocean current that brings warm, salty water from the south to the north.
7. Nicole became an _____ to speak out in support of climate justice.
9. When she was a child, Nicole lived in El Quiche, a _____ forest in Guatemala.
12. Nicole is an _____ who moved from Guatemala to the United States.

### Down

1. _____ communities are those affected the most by climate change.
2. Heat island _____ is when cities experience higher temperatures than smaller towns because buildings and roads absorb the sun's heat.
4. _____ shorelines are coastlines made of plants like mangrove trees or other natural materials that absorb water.
5. Advocates for climate _____want all communities to be treated equally and get the support they need.
6. Nicole serves frontline communities by partnering with them to address climate change in ways that are _____-led and _____-centered.
8. _____ centers are places where people can sit in air-conditioning and get cold water to cool off.
10. _____ are one type of underground space that many cities get their water from.
11. _____-day flooding is when water from underground spaces comes to the surface and causes flooding on sunny days.

# AS THE SEAS RISE

## Answer Keys



### AS THE SEAS RISE

#### Climate Change & Climate Justice

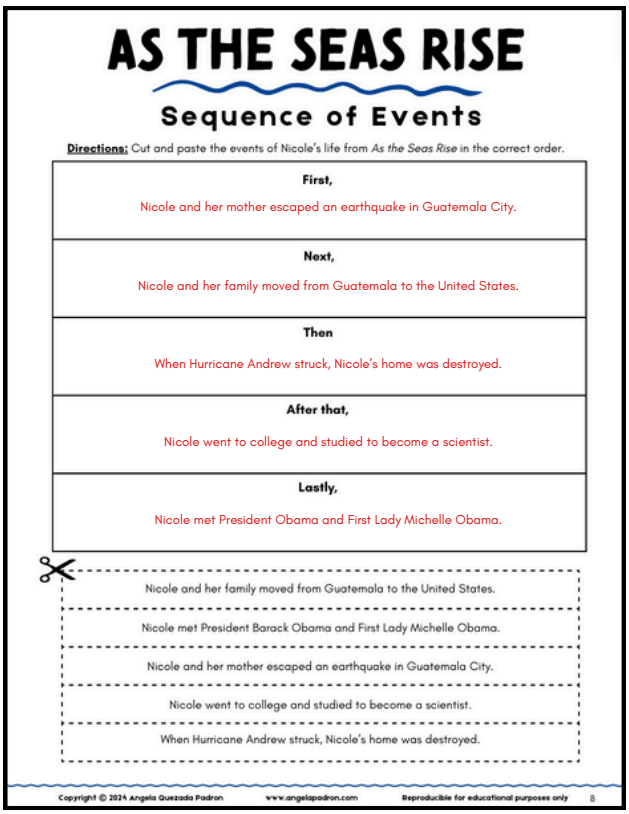
**Directions:** Cut and paste the terms below and place them in the correct category.

| Climate Change | Both | Climate Justice |
|---|---|---|
| extreme weather | affects all people | affects certain communities |
| affects sea levels | affects people's health | addresses equity |
| affects animal habitats | affects the food we eat | addresses racism |
| temperature changes | important to discuss | addresses human rights |

**Challenge!** Why is it important to talk about climate justice when we talk about climate change?

| | | |
|---|---|---|
| affects all people | addresses equity | affects the food we eat |
| extreme weather | addresses human rights | temperature changes |
| affects certain communities | affects sea levels | addresses racism |
| affects people's health | affects animal habitats | important to discuss |





### AS THE SEAS RISE

#### Sequence of Events

**Directions:** Cut and paste the events of Nicole's life from *As the Seas Rise* in the correct order.

**First,**
Nicole and her mother escaped an earthquake in Guatemala City.

**Next,**
Nicole and her family moved from Guatemala to the United States.

**Then**
When Hurricane Andrew struck, Nicole's home was destroyed.

**After that,**
Nicole went to college and studied to become a scientist.

**Lastly,**
Nicole met President Obama and First Lady Michelle Obama.

Nicole and her family moved from Guatemala to the United States.

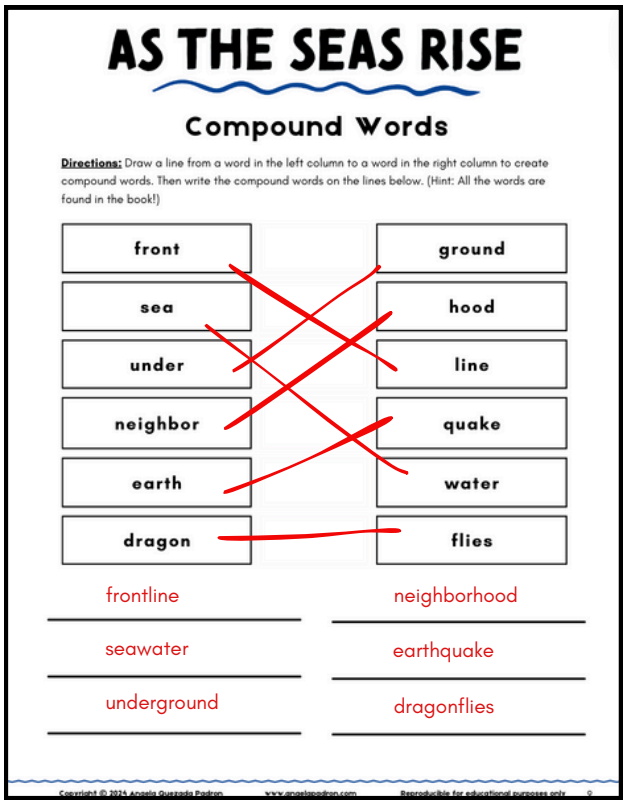
Nicole met President Barack Obama and First Lady Michelle Obama.

Nicole and her mother escaped an earthquake in Guatemala City.

Nicole went to college and studied to become a scientist.

When Hurricane Andrew struck, Nicole's home was destroyed.





### AS THE SEAS RISE

#### Compound Words

**Directions:** Draw a line from a word in the left column to a word in the right column to create compound words. Then write the compound words on the lines below. (Hint: All the words are found in the book!)

| | |
|---|---|
| front | ground |
| sea | hood |
| under | line |
| neighbor | quake |
| earth | water |
| dragon | flies |

frontline

seawater

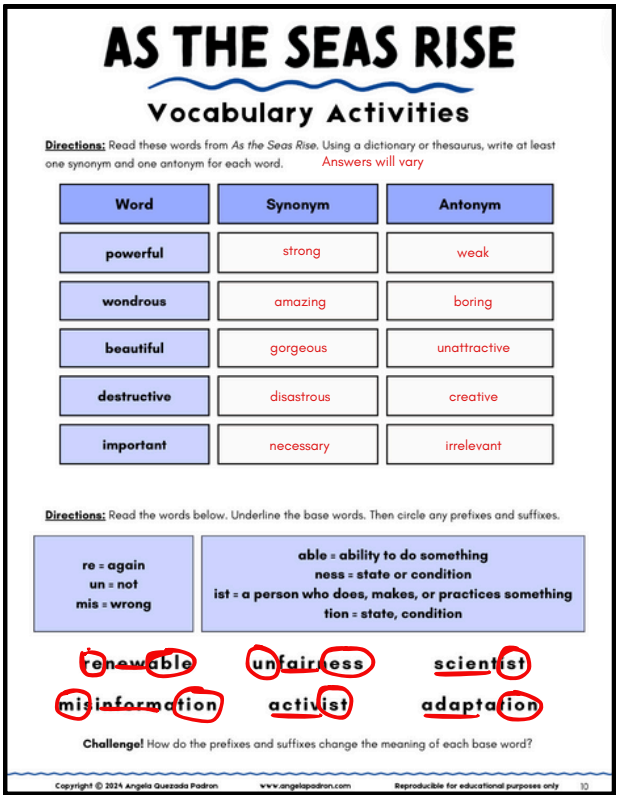
underground

neighborhood

earthquake

dragonflies





### AS THE SEAS RISE

#### Vocabulary Activities

**Directions:** Read these words from *As the Seas Rise*. Using a dictionary or thesaurus, write at least one synonym and one antonym for each word. Answers will vary

| Word | Synonym | Antonym |
|---|---|---|
| powerful | strong | weak |
| wondrous | amazing | boring |
| beautiful | gorgeous | unattractive |
| destructive | disastrous | creative |
| important | necessary | irrelevant |

**Directions:** Read the words below. Underline the base words. Then circle any prefixes and suffixes.

re = again
un = not
mis = wrong

able = ability to do something
ness = state or condition
ist = a person who does, makes, or practices something
tion = state, condition

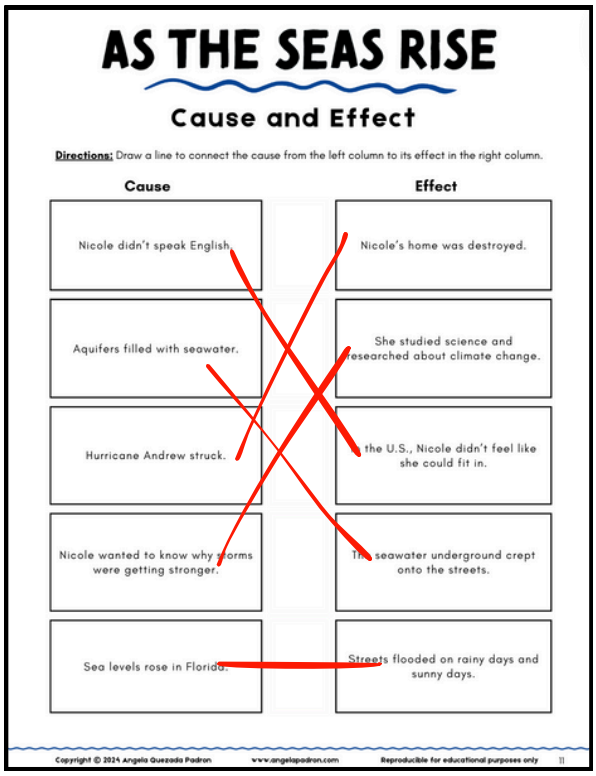
renewable unfairness scientist

misinformation activist adaptation

**Challenge!** How do the prefixes and suffixes change the meaning of each base word?

# AS THE SEAS RISE

## Answer Keys



AS THE SEAS RISE

Cause and Effect

**Directions:** Draw a line to connect the cause from the left column to its effect in the right column.

| Cause | Effect |
|---|---|
| Nicole didn't speak English. | Nicole's home was destroyed. |
| Aquifers filled with seawater. | She studied science and researched about climate change. |
| Hurricane Andrew struck. | In the U.S., Nicole didn't feel like she could fit in. |
| Nicole wanted to know why storms were getting stronger. | The seawater underground crept onto the streets. |
| Sea levels rose in Florida. | Streets flooded on rainy days and sunny days. |

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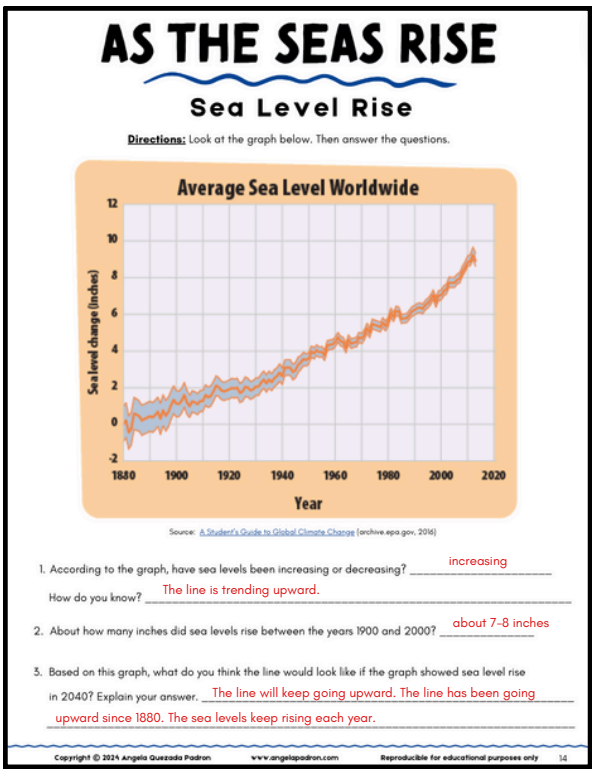


AS THE SEAS RISE

Sea Level Rise

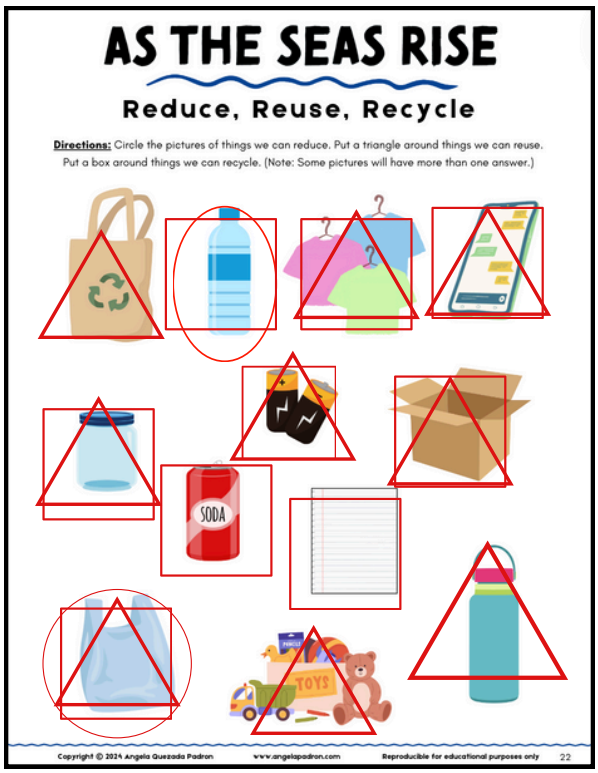
**Directions:** Look at the graph below. Then answer the questions.




Source: A Student's Guide to Global Climate Change (archive.epa.gov, 2016)

1. According to the graph, have sea levels been increasing or decreasing? increasing
   How do you know? The line is trending upward.
2. About how many inches did sea levels rise between the years 1900 and 2000? about 7-8 inches
3. Based on this graph, what do you think the line would look like if the graph showed sea level rise in 2040? Explain your answer. The line will keep going upward. The line has been going upward since 1880. The sea levels keep rising each year.

 14



AS THE SEAS RISE

Reduce, Reuse, Recycle

**Directions:** Circle the pictures of things we can reduce. Put a triangle around things we can reuse. Put a box around things we can recycle. (Note: Some pictures will have more than one answer.)

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AS THE SEAS RISE

Eco-Friendly

**Directions:** For each question, circle the picture that is more eco-friendly. Be ready to explain why you made that choice.

1. Plant-based plastic or regular plastic baggies?
2. Styrofoam or natural fibers containers?
3. Plastic water bottle or aluminum water can?
4. Palm-oil free shampoo or regular shampoo?
5. Reusable bag or plastic bag?
6. Paper towels or air dry?

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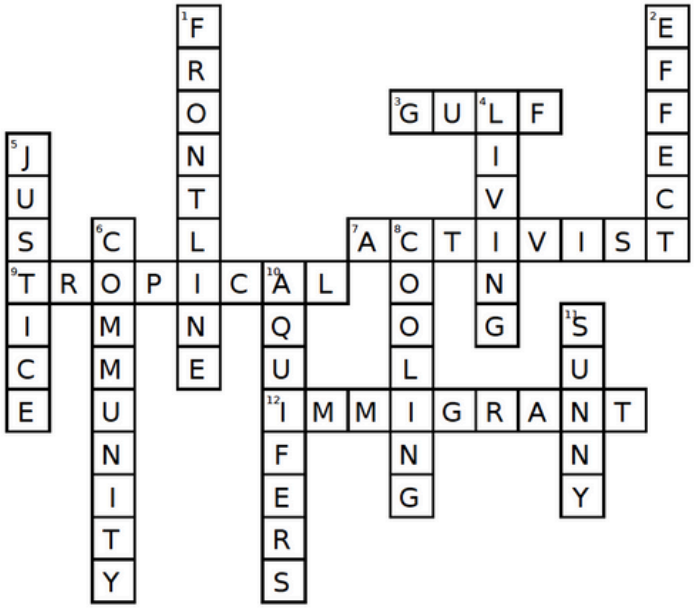
# AS THE SEAS RISE

## Word Search


## Crossword Puzzle



# Additional Resources

Climate Change and Climate Justice, Johnson & Johnson Foundation
https://www.girlscouts.org/content/dam/gsusa/forms-and-documents/activity-zone/all-ages-levels/tree-promise/GSUSA_Tree-Promise_Climate-Justice-Resource.pdf

A Student's Guide to Global Climate Change, Environmental Protection Agency
https://archive.epa.gov/climatechange/kids/impacts/signs/sea-level.html

Sea Level Rise activities - NASA Jet Propulsion Laboratory
https://www.jpl.nasa.gov/edu/teach/activity/the-science-of-earths-rising-seas/

Mayan Symbols and Their Meanings - Trama Textiles
https://tramatextiles.org/pages/maya-textiles

Sea Surface Temperatures - Environmental Protection Agency
https://www.epa.gov/climate-indicators/climate-change-indicators-sea-surface-temperature

Daily Sea Surface Temperature
https://climatereanalyzer.org/clim/sst_daily/

Good Start Packaging (eco-friendly products)
https://www.goodstartpackaging.com/to-go-boxes

Green Paper Products (eco-friendly packaging)
https://greenpaperproducts.com/collections/compostable-containers