

# WATER!

**WHY EVERY DROP COUNTS AND  
HOW YOU CAN START MAKING  
WAVES TO PROTECT IT**

LISA M. GERRY



WITH A  
FOREWORD BY  
**SANDRA POSTEL,**  
WINNER OF THE  
**2021 STOCKHOLM  
WATER PRIZE**



## COMMON CORE ALIGNED FOR GRADE 2-7

<b>2nd grade:</b>	ELA. RI.2.1-4, 6-8; W.2.1-3, 6-8; SL.2.1-4; L.2.4-6
<b>3rd grade:</b>	ELA. RI.3.1-4, 6-8; W.3.1-4, 6-8; SL.3.1-4; L.3.4-6
<b>4th grade:</b>	ELA. RI.4.1-5, 7-8; W.4.1-4, 7-9; SL.4.1-4; L.4.4,6
<b>5th grade:</b>	ELA. RI.5.1-5, 7-9; W.5.1-4, 7-9; SL.5.1-5; L.5.4,6
<b>6th grade:</b>	ELA. RI.6.1-5, 7-8; W.6.1-4, 7-9; SL.6.1-5; L.6.4-5; RST.6-8.1-4, 7; WHST.6-8.7, 8, 9
<b>7th grade:</b>	ELA. RI.7.1-4, 8; W.7.1-4, 6-9; SL.7.1-5; L.7.4-5; RST.6-8.1-4, 7; WHST.6-8.7, 8, 9

## INTRODUCTION

1. Do you know where the water that flows out of your kitchen faucet comes from? Can you guess? Some states provide interactive maps that illustrate detailed information about where your tap water comes from. Conduct an internet search to see if you can find any information about your local water source.
2. The introduction states that “everything we use, wear, buy, and eat takes water to make.” Choose five items you can see from where you are sitting right now. Can you guess how water was used in the production of these five items?
3. Sandra Postel, the author of the introduction, is listed as the 2021 Stockholm Water Prize Laureate. Visit [www.siwi.org](http://www.siwi.org) (Stockholm International Water Institute) to learn more about this prize, the selection process, and the work of Sandra Postel that led her to receiving this honor. Then, write a thank-you letter to Sandra Postel, for her work on behalf of Earth’s water supply.



# CHAPTER ONE

## Water 101

- Chapter one introduces six reasons humans should care about water. Record what is presented there in the following table and then list any other questions you may have that you hope are answered in this book or through further research.

WHY HUMANS SHOULD CARE ABOUT WATER	EXPLAIN IN YOUR OWN WORDS	QUESTIONS YOU MAY HAVE
Humans need water to live.		
All species on Earth need water to live.		
Many people don't have the water they need.		
Many of Earth's bodies of water are polluted.		
The quality of many people's drinking water is poor.		
As climate change worsens, water issues do, too.		

- According to page 14, how was the Earth formed?
  - Where did water come from?
- Where is the majority of Earth's freshwater found?
  - Why is freshwater so important?
- Aside from oceans and lakes, where else can water be found?
- "Earth contains a finite amount of water." Explain this statement in your own words.
  - Given this statement, how does water connect us to one another?
- Define the following terms regarding the water cycle.
  - Evaporation
  - Transpiration
  - Condensation
  - Precipitation
- Create a poster to illustrate the water cycle.
- What are the main ways that freshwater ecosystems are being harmed?
  - Brainstorm ways that humans can help revive these biomes instead of harming them.
  - Visit the Environmental Protection Agency's website at <https://www.epa.gov/sourcewaterprotection/how-can-you-help-protect-source-water> for further information.



## Create a Mini Water Cycle

Whether it is a liquid, a gas, or a solid, water is always changing. This process is called **the water cycle**.

Observe the water cycle in action with this simple experiment.

You will need:

- a large metal or plastic bowl
  - a pitcher or bucket
  - water
  - a sheet of clear plastic wrap
  - a dry ceramic mug (like a coffee mug)
  - a long piece of string or large rubber band
1. Place the bowl in a sunny place outside.
  2. Using the pitcher or bucket, pour water into the bowl until it is about  $\frac{1}{4}$  full.
  3. Place the mug in the center of the bowl. Be careful not to splash any water into it.
  4. Cover the top of the bowl tightly with the plastic wrap.
  5. Tie the string around the bowl to hold the plastic wrap in place.
  6. Watch the bowl to see what happens.

A “mist” will form on the plastic wrap and eventually change into larger drops of water that will begin to drip. (You can speed up the dripping by carefully moving the bowl—don’t splash!—into the shade.)

Water from the “ocean” of water in the bowl evaporated, and then condensed to form misty “clouds” on the plastic wrap. When the clouds became saturated, it “rained” into the mug!



# 2

## CHAPTER TWO

### Water and You

1. Define “water footprint” in your own words.
2. Think of one item from each of the following categories and conduct a quick internet search to discover what the “water footprint” of that item is. Search “water footprint of \_\_\_\_\_.”
  - a. Something we eat
  - b. Something we buy
  - c. Something we wear
3. Pages 32–33 introduce the many ways humans use surface and groundwater. In the chart below, explain in your own words how important this use is.

USE	IMPORTANCE
Sanitation	
Aquaculture	
Industrial Use	
Livestock	
Mining	
Thermoelectric Power	
Irrigation	

4. Do an internet search of your town or city’s water and how it is treated.
5. Define the following terms in your own words as they apply to water treatment.
  - a. Coagulation and flocculation
  - b. Sedimentation
  - c. Filtration
  - d. Disinfection

6. Name at least three freshwater sources that people use around the globe.
  - a. How many of these sources have you or someone in your home used at one time or another?
  - b. "At least two million people in the United States don't have access to running water or basic indoor plumbing." Where and why?
7. Read through the "10 Ways to Conserve Water at Home" on pages 40–41 and then create an action plan for your own household that implements at least four ways to cut down on water usage.

## Keeping Our Rivers Clean

On a piece of paper, draw two blue lines that represent a river. What kinds of plants and animals live in and around this river? Draw these plants and animals (add labels, if needed) in and around the river.

On a second piece of chart paper, draw a house with a series of pipes that lead toward the river.

- Where does the wastewater leaving the house come from (e.g., toilet, sink, tub, washing machine)?
- Is this wastewater clean?
- What kinds of things would be in the wastewater? Draw this wastewater in the pipes (add labels, if needed).

On the edge of the paper with the house on it, draw a large circle to represent a water treatment plant—a place where wastewater is cleaned before it reaches the river.

- Where else might wastewater come from?
- Draw buildings and businesses around the house with pipes coming from them.
- What might happen to the river if wastewater flowed directly there and was not treated first?
- What if there was a heavy rain and the rainwater mixed with the sewer water? What might happen?

Finally, connect all of the pipes from the buildings and houses to the water treatment plant.



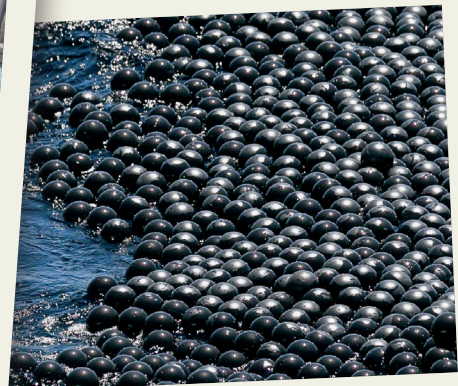


# 3

## CHAPTER THREE

### Water Everywhere ... or Is It?

1. What are the four main reasons for freshwater scarcity?
2. Explain the conditions in Cape Town, South Africa, that caused the government officials to issue a warning regarding water.
  - a. How did the people of Cape Town prevent Day Zero from happening?
  - b. In Cape Town, the citizens conserved water by only showering for two minutes. Do you think you could do this? According to the Environmental Protection Agency (EPA), the average shower length in the U.S. is eight minutes, and the average showerhead dispenses 2.1 gallons of water per minute. That's a lot of water. Create your own playlist of "Shower Songs" that will help you keep track of and cut down on the time you spend in there.
3. Explain the following measures implemented to save water:
  - a. Recycling of wastewater
  - b. Desalination
  - c. Shade balls
4. In some countries, the problem of freshwater scarcity has also created inequality between girls and boys. How so?
5. Using Syria as an example to support your answer, how can war deny people access to essential resources, including water?
6. Who is Georgie Badiel?
  - a. How has the Georgie Badiel Foundation made a difference in the challenges concerning water in Burkina Faso?
  - b. Why does the Georgie Badiel Foundation teach women how to fix and maintain wells?
7. What is 70 percent of Earth's freshwater used for?
8. What is "dry farming" and how can it help conserve water?



# 4

## CHAPTER FOUR Water Pollution ... and Some Solutions!

1. What is “pollution”?
2. Record what you learn about water pollution in the chart below.

TYPE OF WATER POLLUTION	EXPLAIN IN YOUR OWN WORDS	BRAINSTORM IDEAS TO HELP
Agricultural		
Stormwater		
Sewage and Wastewater		
Plastic		
Oil		

3. Describe the water situation in Flint, Michigan, in your own words.
  - a. How did Mari Copeny speak up for her community to make a difference?
  - b. How can you be a water advocate like Mari?
4. Draw a diagram detailing where the water from your faucets and toilets at home go when you rinse and flush.
  - a. What are “straight pipes” and what danger do they pose?
  - b. What did Stella Bowles do when she discovered the problem?
  - c. How can you be a water advocate like Stella?
5. What are algal blooms? Why are they so dangerous?
  - a. How can people reduce algal blooms?





# Watersheds

**What is a watershed?** A watershed is an area of land that drains into a body of water. Every place on Earth has its watershed, and we all live within a watershed.

Turn an opened umbrella upside-down in the rain, and you'll see how a watershed works. A watershed is an area of land that catches precipitation (rain, sleet, snow) that flows and drains into a body of water such as a wetland, stream, river, lake, or groundwater.

Create a paper model of a watershed. You will need:

- Two sheets of paper. Use paper from the recycling bin, if possible.
  - A spray bottle filled with water.
  - Non-permanent markers so the colors will run when moistened. You'll need 3-4 different colors (blue, brown, green, and red.)
  - A tray or several old newspapers or rags to catch the water.
1. Take one sheet of paper and crumple it up in your hands.
  2. Then open up the paper, but do not flatten it. You want to have some "relief"—some high and low places. The high places are hills, the low spots are valleys, and the wrinkles are streams and rivers.
  3. With the blue marker, draw on the paper where you think the streams and rivers would be.
  4. Place the paper on a tray or the newspapers or rags. With the spray bottle, make it rain in the watershed by squirting a fine mist over the crumpled paper model, enough to make water flow down the "hills."
    - a. Did you draw the streams and rivers in the right places?
    - b. Do you have a lake?

This is how watersheds function—the water is shed by the land into streams, rivers, and lakes.

5. Now do the same thing with the second piece of paper. Crumple it and then open it up but not too much.
6. Draw the streams and rivers with the blue marker. Maybe include a lake or two.
7. Next, use the brown marker and draw along the tops of the hills. With a green marker you can draw trees, grass, and crop or pasture land. Use a red marker to draw towns, houses, or businesses.
8. Place the "watershed" on a tray or the newspapers or rags, and mist it with water.

You'll see streams again. But you will also see a lot of other stuff (colors) running into the streams along with the water. If this were a real watershed, the brown would be dirt from bare soil, the green could be grass clippings or leaves, and the red could be oil from leaky cars or fertilizer someone spilled. That's what happens when materials like these on the ground are picked up and carried away by stormwater runoff. They end up in streams and rivers moving down the watershed.

Our daily activities around our homes, on our streets, and in our neighborhoods can greatly impact the quality of our water. Making informed choices about our activities, such as washing our cars, changing the oil in our cars, and having our pets go to the bathroom outdoors can greatly affect the amount of pollution going into our lakes and rivers every time it rains or the snow melts. To reduce the amount of pollution going into our streams, rivers, and lakes, you can do the following:

- Wash your car at the car wash or on your lawn (not driveway) and use as little soap as possible.
- Pick up pet waste and put it in the trash.
- Keep storm drains free of debris and litter.
- Bring used oil to a disposal facility; do not dump it on the ground or into a storm drain.
- Brainstorm other ways to reduce watershed pollution in your area.

# 5

## CHAPTER FIVE A Changing Climate

1. What is climate change?
  - a. What is one of the biggest contributors to climate change? Explain.
2. As Earth warms, there is an effect on our water. Record these effects in the chart below.

CLIMATE CHANGE'S EFFECT ON WATER	EXPLAIN IN YOUR OWN WORDS
Warmer air and greater precipitation	
The melting of glacial ice	
Irregular change in seasons	
Ocean acidification	
More frequent and severe droughts	
A rise in ocean temperatures	
Different, uneven weather patterns	

3. What is the Paris Agreement?
4. How did Greta Thunberg inspire young people to “join together to show the world how important it is that everyone, everywhere, do everything they can to combat climate change and fight for the future of our planet”?
  - a. Visit <https://fridaysforfuture.org> to see how you can get involved in this important cause. Then write a proposal to your school administration or teacher, suggesting that your school or class participate in a strike, as detailed on the organization’s website.
5. What are “sponge cities” and how do they combat flooding in urban spaces?



# Climate Change and Its Impact on Our Water

Systems to treat wastewater and to clean and filter drinking water have impacted our water quality for the better. But a new threat, climate change, is affecting the quality and quantity of the water in U.S. rivers.

Conduct internet research on one of the following elements of climate change:

- Increase in annual precipitation
- Drought
- Coastal flooding
- Shrinking lakes
- Freshwater flooding
- Saltwater intrusion
- Changes in snowfall

How are water systems and quality of water impacted by these elements of climate change?  
Is climate change impacting our sewers?

Create posters informing others of the dangers of climate change to our water and then display them.



# 6

## CHAPTER SIX

### Saving the World's Oceans

- How does plastic pose a problem for our oceans and marine life?
  - What is the Great Pacific Garbage Patch?
  - Look up images of the garbage patch online.
- The chart below illustrates actions to take that reduce the daily use of plastic.

ACTION TO REDUCE PLASTIC	WILL YOU DO IT? EXPLAIN	IF NOT, WHY?
Buy loose fruit and vegetables rather than prepackaged.		
Buy laundry detergent in cardboard boxes.		
Use bars of soap instead of liquid.		
Drink beverages that come in glass bottles.		
Stop using single-use wipes.		
Use a reusable water bottle.		
Use reusable tote bags or paper instead of plastic bags.		
Stop using plastic straws.		
Reuse jars and containers for storing food.		
Use reusable chopsticks and cutlery.		
Cut down on plastic takeout food containers.		



# The Problem With Plastic

Scientists have been warning us since the 1970s that plastics are accumulating in our oceans, waterways, and along our coasts. Great circular patches of plastic have been found floating in virtually every ocean on the planet. The islands of plastic waste have been sighted in the Caribbean, the Pacific Ocean, and off the coast of Indonesia.

By creating plastic and then discarding it without considering the consequences, we are causing great harm to our oceans, the marine plants and animals that live there, and many coastal communities. The good news? Because humans are the ones causing the problem, we also have the power to solve it!

For one week:

1. Go on a plastic journey—make note of all the single-use plastic items you use throughout the day that are simply thrown away.
2. Take a look in your recycling bin and garbage cans to make sure you record all plastic items.
3. Save the single-use plastic items you use each day.

Then ...

4. Weigh the plastic you have collected over the week.
5. Brainstorm ideas about how the waste produced could be reduced—not only by recycling, but also by reducing use.
6. Use the collected plastic to make a sculpture or art installation to raise awareness of the pollution problem and the effect of plastic pollution on oceans.





# 7

## CHAPTER SEVEN

### Kids Can Make a Difference

Join the global mission to raise awareness, educate, and impassion citizens of the world on ways to protect and preserve Earth's waters, endangered marine life, and marine habitats.

Here are some ways you can make a difference:

1. **Raise Awareness.** Spread the word in your communities of the importance of our oceans and the dangers affecting the ocean and its inhabitants. Create a poster or flyer campaign to educate people about it.
2. **Create a school or community mural** entitled WE NEED OUR OCEANS to motivate action and increase awareness.
3. Pollution of any kind can get into our waterways. **Clean up nature**—volunteer your time to help clean debris and weeds.
4. **Support ocean and beach conservation organizations**—raise funds through bake sales or car washes so that these organizations can educate people. Contributions and other support of these organizations help ensure future endeavors and possibilities for generations to come.
5. **Be respectful to Mother Earth.** By doing your part, you are reducing the heavy load resting on the shoulders of our great planet.

## Pledge 50 Ways to Help

Want to do more to help our planet? Check out 50 Ways to Help <http://www.50waystohelp.com> and pledge to do at least one of these simple tasks each day for a month.

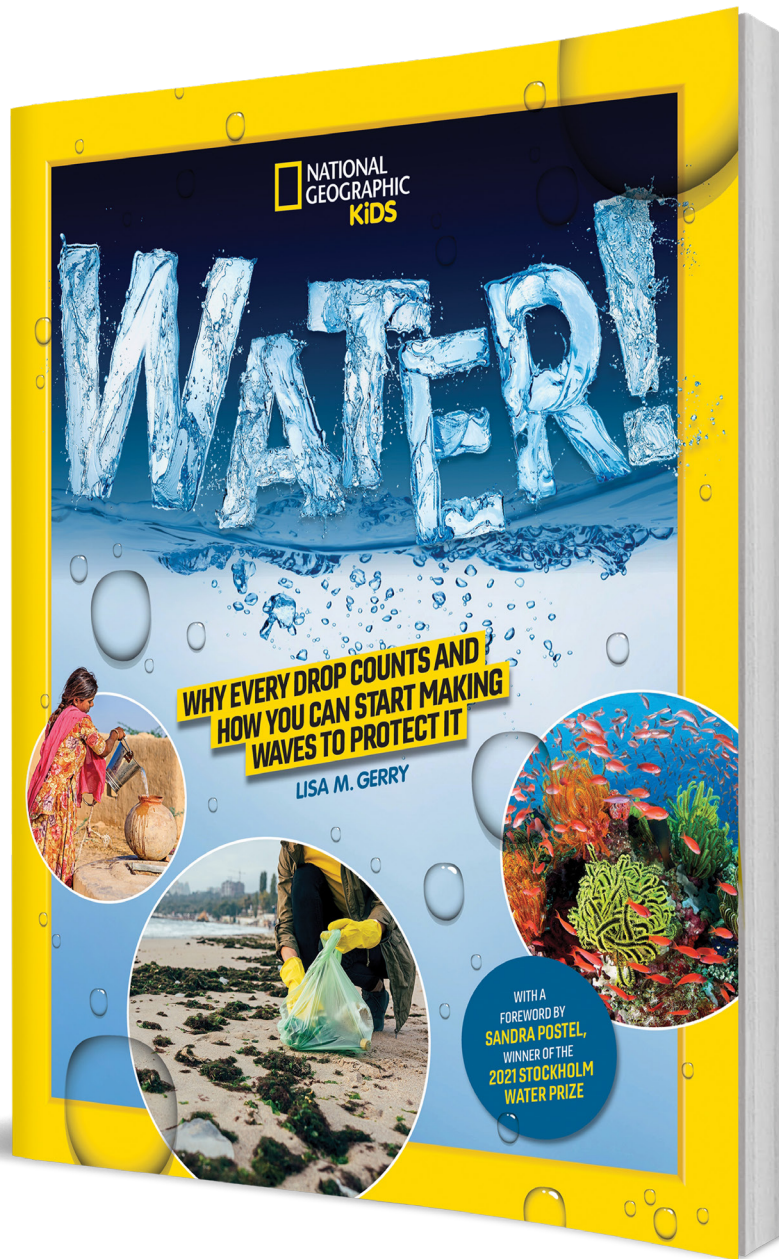
Each task earns you one point. How many points can you earn before the month is up? Set a class goal and celebrate with an eco-friendly party if the goal is met.

Keep a daily journal of your efforts to share with your class.





Many more guides can be found on Disney • Hyperion website at [www.disneybooks.com](http://www.disneybooks.com).



## **WATER!**

Paperback  
978-1-4263-7355-8  
\$14.99

Reinforced Library  
Edition  
978-1-4263-7381-7  
\$24.90

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