
SCIENCE FOR
Little Hearts AND Hands
WIND and WAVES
PARENT GUIDE
The Good AND THE Beautiful
CURRICULUM

SCIENCE FOR LITTLE HEARTS AND HANDS

Wind and Waves

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About This Course

Little children's hearts and minds are most impressionable during the preschool and early elementary years, so it's an important time for molding the way they view learning. Your enthusiasm while teaching in a positive and uplifting manner can help foster a love of learning and a desire for all things good and beautiful. This course strives to assist you in creating a solid educational foundation through fun, interactive, hands-on lessons that require minimal preparation.

What Does the Course Set Include?

- **Full-color, wire-bound *Parent Guide***
- ***The Big Book of Science Stories***

  The Big Book of Science Stories contains beautifully illustrated stories that will inspire interest and wonder in a variety of science topics.

- **Lesson Audio Narrations**

  Lesson audio narrations are included and will be accessed every few lessons. These audio narrations share interesting facts about the topics studied in a fun and engaging manner.

How to Get Started with This Course

No preparation time is required for this course. Some activities will need additional supplies, which are listed on pages 7–9.

To complete lessons, simply follow the instructions on each page. Instructions in orange text are for you; text in black is what you read to the child.

Lesson Overview

The *Science for Little Hearts and Hands: Wind and Waves* course consists of 30 lessons. Each lesson is parent directed and provides detailed teaching for young learners. The lessons are taught in story, audio narration, or activity format, with directions for the parent included in the lesson. These lessons can be completed in any order, which allows the parent to follow his or her child's interests.

Lesson Text

To complete lessons, simply follow the instructions on each page. Instructions in orange text are for you; text in black is what you read to the child.

Each lesson has a brief introduction, then instructs you to read one story from *The Big Book of Science Stories*, listen to an audio narration, or perform an activity. Finally, return to this *Parent Guide* for discussion questions and optional activities.

The Big Book of Science Stories

If instructed to do so in the lesson, read the suggested story to the child, taking time to enjoy the detailed illustrations. Every few lessons include a story from this resource.

Audio Narrations

Audio narration lessons can be found at **goodandbeautiful.com/heartsandhands** (password available with purchase) or on the Good and Beautiful Homeschool app. There are seven lessons throughout the unit that have audio narrations. In each of these lessons, you will be directed to remove and assemble the pawn from the perforated pages at the end of the unit. The child will use the pawn to follow along with illustrations that accompany the audio narration. The pawns do not need to be saved for future lessons.

Activities

Opening activities are listed at the beginning of each lesson, and optional activities are listed at the end of each lesson. Any supplies needed are listed on pages 7–9 and at the beginning of each lesson. These activities are not required but are offered as enhanced learning opportunities for you to complete with your child.

Important Safety Notice

The optional activities in this course may suggest using small items, such as dried beans. Please monitor all young children in your home around these items to prevent problems with choking. If you feel these items put any of your children at risk, do not use them.

Frequently Asked Questions

How long will a lesson take?

Lesson length will vary greatly among children. Have the child do as much work each day as the child's attention span will allow. You do not need to complete one lesson a day. You might do more or less than that. Look for cues of frustration or fatigue to help you know when to finish. The child will learn much from you as you display love, patience, and enthusiasm for learning. At this age it's important that the learning feels more like fun to the child than something forced or unpleasant.

Do you include any specific doctrine?

No, the goal of our curriculum is not to teach doctrines specific to any particular Christian denomination but to teach general principles, such as honesty, hard work, and kindness.

Is there anything I need to do to prepare for a lesson?

This course is written as an open-and-go course. Activity supplies are listed on pages 7–9, and access to the Good and Beautiful Homeschool app is needed for some of the lessons.

Activity Supplies

Opening activities are listed at the beginning of each lesson, and optional activities are listed at the end of each lesson. Optional activities are not required but are offered as enhanced learning opportunities for you to complete with your child.

Lesson 1: What Is a Meteorologist?

Optional Activity

- paper
- crayons or markers
- device to look up weather

Lesson 2: Weather Forecasting

- glass cup
- water
- 2 pieces of paper
- balloon
- scissors
- glass jar
- rubber band
- drinking straw
- tape
- white cardstock or other stiff paper
- pencil
- crayons

Lesson 3: Temperature

- ice cube

Optional Activity

- weather thermometer

Lesson 4: The Water Cycle

- cup of water

Optional Activity

- large bowl (clear, if possible)
- very warm water in the bowl
- salt
- small container
- plastic wrap
- ice cubes

Lesson 5: Clouds

Optional Activity

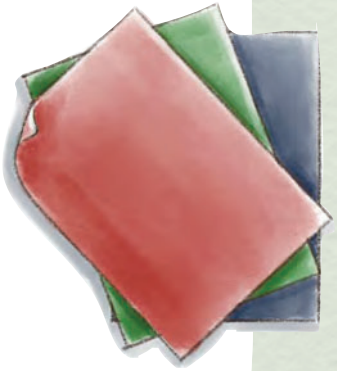
- glue
- cotton balls
- construction paper
- gray paint, marker, or crayon

Lesson 6: Wind

- blade of grass

Optional Activity

- small piece of toilet paper or some other very light object
- kite



Lesson 7: Rain and Snow

Optional Activity

- square piece of paper
- scissors

Lesson 8: Rainbows

- piece of white paper
- sunny window or a flashlight
- tape
- glass of water
- red, orange, yellow, green, blue, indigo, and violet crayons or colored pencils

Lesson 9: Floods

Optional Activity

- casserole dish or medium-sized plastic container
- dirt or sand
- water
- toys or wooden blocks

Lesson 10: Tornadoes and Hurricanes

Optional Activity

- wide-mouthed water bottle or mason jar with straight sides and a lid
- water
- dish soap

Activity Supplies cont.

Lesson 11: Lightning and Thunder

Optional Activity

- balloon

Lesson 12: Light and Shadows

- scissors
- bright flashlight
- clear glass jar
- juice
- rock, block, or spoon
- wooden craft stick
- tape

Optional Activity

- a variety of toys or other objects as subjects for your art
- paper
- colored pencils, crayons, or markers
- sidewalk chalk as alternative to paper and drawing utensils

Lesson 13: Reflection of Light

- small mirror

Optional Activity

- a sunny day
- "dull" household items
- "shiny" household items

Lesson 14: Light and Color

- red, blue, and yellow crayons
- paper

Optional Activity

- tempera or watercolor paints
- paintbrush
- cardstock or construction paper
- water

Lesson 15: Bodies of Water

Optional Activity

- paper
- watercolor paint
- water
- paintbrush

Lesson 16: Salt Water and Fresh Water

- 2 glasses of water
- 1 Tbsp salt
- 2 spoons

Optional Activity

- 2 glasses
- 2 cups of warm water
- ¼ c salt
- 2 small carrots
- other items for experimentation if desired

Lesson 17: What Is a Marine Biologist?

- scissors
- paper
- pencil and colored pencils or markers

Lesson 18: Sand and Seashells

Optional Activity

- a few cups of sand
- a few cups of cornstarch or flour
- vegetable oil
- plastic tub or other container
- measuring cups, spoons, or any other rounded items

Lesson 19: Wonderful Waves

- bowl
- water
- towel

Optional Activity

- items listed above
- small items that can be placed in the water
- straw

Lesson 20: Names of the Oceans

Optional Activity

- paper
- blue, green, and black markers

Activity Supplies cont.

Lesson 21: Zones of the Ocean

Optional Activity

- 5 bowls
- red, green, and blue food coloring
- ¾ c corn syrup
- .9-L (32-oz) clear jar
- ¾ c clear dish soap
- funnel
- ¾ c water
- ¾ c cooking oil
- ¾ c rubbing alcohol
- medicine dropper
- masking tape
- permanent marker

Lesson 22: Animals of the Open Ocean

- ruler
- 1–2 items that are 1.3–30.5 cm (.5–12 in) long, such as a cracker, a pencil, or a paper clip
- dime

Optional Activity

- 2 bowls
- water
- ice cubes
- 2 quart-sized zip-top bags
- vegetable shortening
- spatula
- 2 gallon-sized zip-top bags

Lesson 23: On the Seashore

- piece of paper
- globe or map showing shorelines

Optional Activity

- paper
- pencil
- colored pencils or markers

Lesson 24: Coral Reefs

- two small items that can be used as game tokens, such as goldfish crackers
- six-sided dice

Lesson 25: Animals of the Coral Reef

- none

Lesson 26: Animals of the Sunlight and Twilight Zones

Optional Activity

- 2 colors of play dough—one lighter and one darker

Lesson 27: Animals of the Midnight Zone

Optional Activity

- paper bowl
- glow-in-the-dark acrylic paint
- paintbrush
- scissors
- brightly colored yarn
- tape or glue

Lesson 28: Sharks

Optional Activity

- two balloons
- ¼ c water
- ¼ c vegetable or canola oil
- permanent marker
- medium-sized tub filled with water

Lesson 29: Dolphins

- none

Lesson 30: Funny Fish

- scissors
- small basket, bowl, or net
- glue

WHAT IS A METEOROLOGIST?

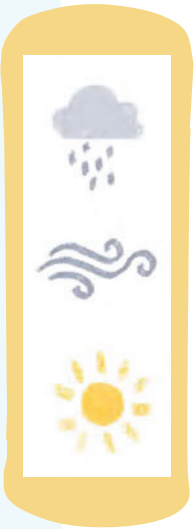
Supplies Needed

Optional Activity

- paper
- crayons or markers
- device to look up weather

Opening

Read to the child: Look at the first pattern below and see if you can determine which picture from the yellow box should come next. [windy]

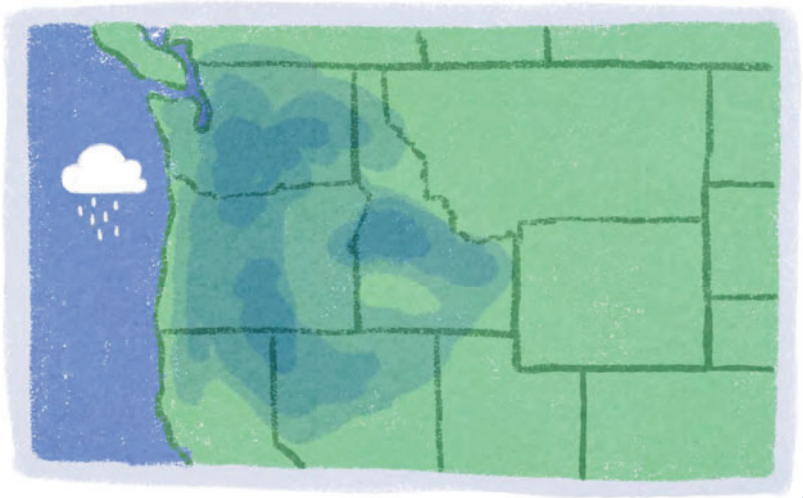


We figured out what should come next in this sequence because the pattern repeated itself. Patterns often repeat, but not always. Look at this next pattern. Can you figure out what may come next? Point to the correct picture from the yellow box. [cloud with rain]

Read to the child: A particular type of scientist looks at patterns in the weather and then uses those patterns and trends to predict the weather in the near future. This type of scientist is called a *meteorologist*. Meteorologists are important because they not only help us know whether or not we can plan outside activities for the day and what we should wear to be comfortable, but they also do so much more.

Story Time

Read to the child "A Day at the News Station" on page 4 of ***The Big Book of Science Stories***, and then return to the ***Parent Guide*** for discussion questions.



Discussion

* Q: What is the atmosphere?
* A: The atmosphere is the protective layer of air (gases) that surrounds our planet. All of Earth's weather occurs within the atmosphere.
* Q: What is a meteorologist?
* A: A meteorologist is a scientist who studies weather patterns and predicts future weather.
* Q: What would be your favorite part of being a meteorologist?
* A: Answers will vary. Any of the following may be discussed: studying the weather patterns and predicting the future weather (science), analyzing the data/numbers from temperature and pressure readings (math), designing maps and colorful weather illustrations (computer and design), or being on TV.

Optional Activity

On a piece of paper, draw three vertical lines to divide the paper into four columns. Help your child look up what the weather has been for the past three days and draw a picture for each of those days. Next, discuss what he or she thinks the weather will be for the fourth day and draw a picture of that as well.

LESSON 2

WEATHER FORECASTING

Supplies Needed

- glass cup
- water
- 2 pieces of paper
- balloon
- scissors
- glass jar
- rubber band
- drinking straw
- tape
- white cardstock or other stiff paper
- pencil
- crayons

OPENING

Read to the child: Look at the images below and point to the picture(s) that most closely describe yesterday's weather. Now show me the picture(s) that are like today's weather. Great! If you were to take a guess at what tomorrow's weather might be, which picture(s) would you choose and why?

Read to the child: Making a *prediction*, or a good guess, about what the weather will be in the future is called *forecasting*. A *weather forecast* helps you make decisions about what you will wear or what activities to do. For instance, would it be wise to plan a trip to the beach on a day when a thunderstorm is expected? Or would you wear snow clothes to the park on a warm, sunny day? No! While predictions about the weather are not always accurate, weather forecasts can give you a good idea about what to plan for so you don't end up wearing shorts and sandals in a snowstorm!

Experiment Time

Read to the child: We can make weather predictions by using a few tools that are designed to find out information from the atmosphere. You breathe in the air from our atmosphere every day, and that air plays a very important part in our weather.

The atmosphere is a word used to describe all the layers of air that surround our earth.

You may not think of air as being something that is heavy or has weight. But it does have a weight, and its heaviness presses on things. This is called air pressure. Sometimes that weight is heavier than other times, and so we measure that pressure to understand weather patterns.

Complete the following steps as a demonstration for the child.

1. **Fill a glass cup ¼ full of water.**
2. **Fold a piece of paper in half.**
3. **Place the paper over the top of the cup and seal it with your palm.**
4. **Over a sink, hold the paper tightly in place with one hand (so that no water leaks out) as you turn the cup upside down with your other hand.**

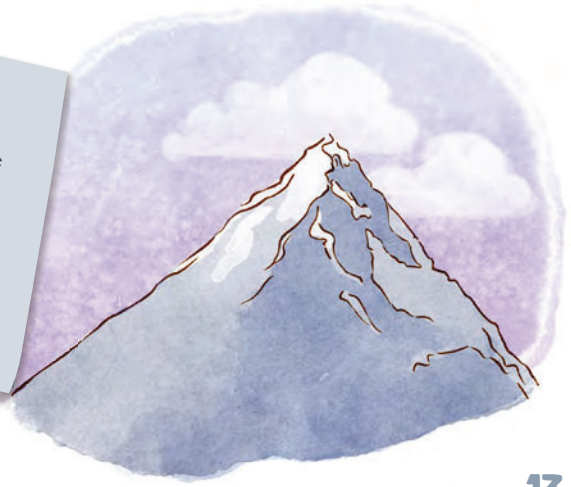
Read to the child: What do you think will happen if I remove my hand that is holding the paper in place? **Continue holding the cup upside down as you gently remove the hand that is holding the paper.** Why do you think the paper didn't fall down?

The air molecules outside the cup are heavier than the water inside the cup, so the air can put pressure on the paper to hold the paper and the water in place. **If desired, allow the child to try the experiment.**

Molecules are very, very small units that make up everything that is in this world. Water is made of molecules, air is made of molecules, and even you are made of trillions of molecules.

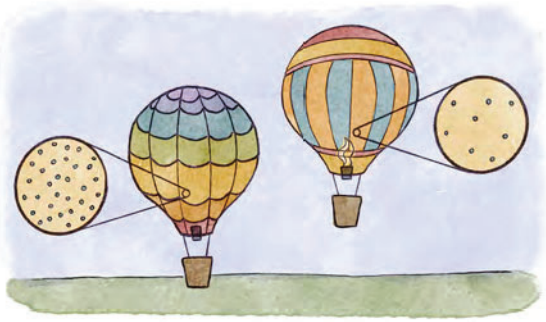
The amount of air pressure varies around the world. Two things can raise or lower air pressure. *Altitude*, the height of an object above the level of the sea, is the first thing that can affect air pressure. Mountains and other areas that have a higher altitude have less air pressure than places at the same height as the ocean level simply because there is less air the higher you go. Second, temperature also affects air pressure. What do you notice about the molecules of air in these hot-air balloons as they get warmer?

If you are playing on the beach at the ocean, you are at a lower altitude, so you are closer to the center of the earth. If you are standing at the top of a mountain, you are at a much higher altitude than the beach.



When molecules get warmer, they spread apart. Knowing this, which type of air do you think is heavier—cold air or warm air? Cold air is heavier and denser, with more molecules taking up the same space, and that creates a higher level of air pressure!

When air pressure changes, it causes other things in the atmosphere, such as wind and clouds, to move. Areas of lower pressure tend to have rainy or stormy weather, while areas of higher air pressure make for nice, sunny weather.



Make a Barometer

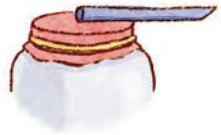
Read to the child: We are going to make a tool to measure the air pressure. It is called a *barometer*. **Help the child complete the following steps to build a simple barometer.**

1. Take a balloon and cut off the skinny neck of the balloon.

2. Tightly stretch the balloon over the opening of a glass jar so that it is completely flat, and then secure it with a rubber band.

Take a drinking straw and, at an angle, cut off one-half of an inch from the end (for a straw with a bend, cut off the bendy section).

3. Lay the uncut end of the straw on the balloon. Line the end of the straw up with the center of the balloon. Leave the cut side sticking off the edge of the jar with the pointed end facing up and tape the straw in place.



4. Take a piece of white cardstock or other stiff paper and tape it to a wall, standing up, in an area where it can be observed for several days. Place the jar so that the "pointer" of the straw is close to the paper but not touching it. With a pencil make a line on the paper where the "pointer" of the straw is.

5. Then use crayons to draw two other lines, about an inch above and below that line. Above the top line, draw a sun; below the bottom line, draw a rain cloud.

6. Observe the level of the straw for several days. As air pressure rises, the cut end of the straw will point higher than the midline because the air will press down on the middle of the balloon. As pressure lowers, the cut end of the straw will point below the midline.

Be a Weather Watcher

You can forecast the weather using a few observational tools.

1. Look outside and, if possible, go outside. Make notes or draw pictures about what you see and feel.

2. Pay attention to the wind. Is there wind? If so, watch and feel to see if you can tell what direction it is coming from.

3. Use a thermometer (or a weather app) to track and record the temperature.

4. Use a barometer, such as the one on the previous page, to track low and high air pressure.

Consider keeping a journal to record the weather each day and make predictions for upcoming days.

Discussion

* Q: What does a barometer measure?
* A: A barometer measures air pressure.
* Q: Which type of air pressure is associated with rainy, cloudy weather?
* A: Low air pressure is associated with rainy or cloudy weather.
* Q: What type of weather is your favorite?
* A: Answers will vary.

LESSON 4

THE WATER CYCLE

Supplies Needed

- cup of water

Optional Activity

- large bowl (clear, if possible)
- very warm water in the bowl
- salt
- small container
- plastic wrap
- ice cubes

OPENING

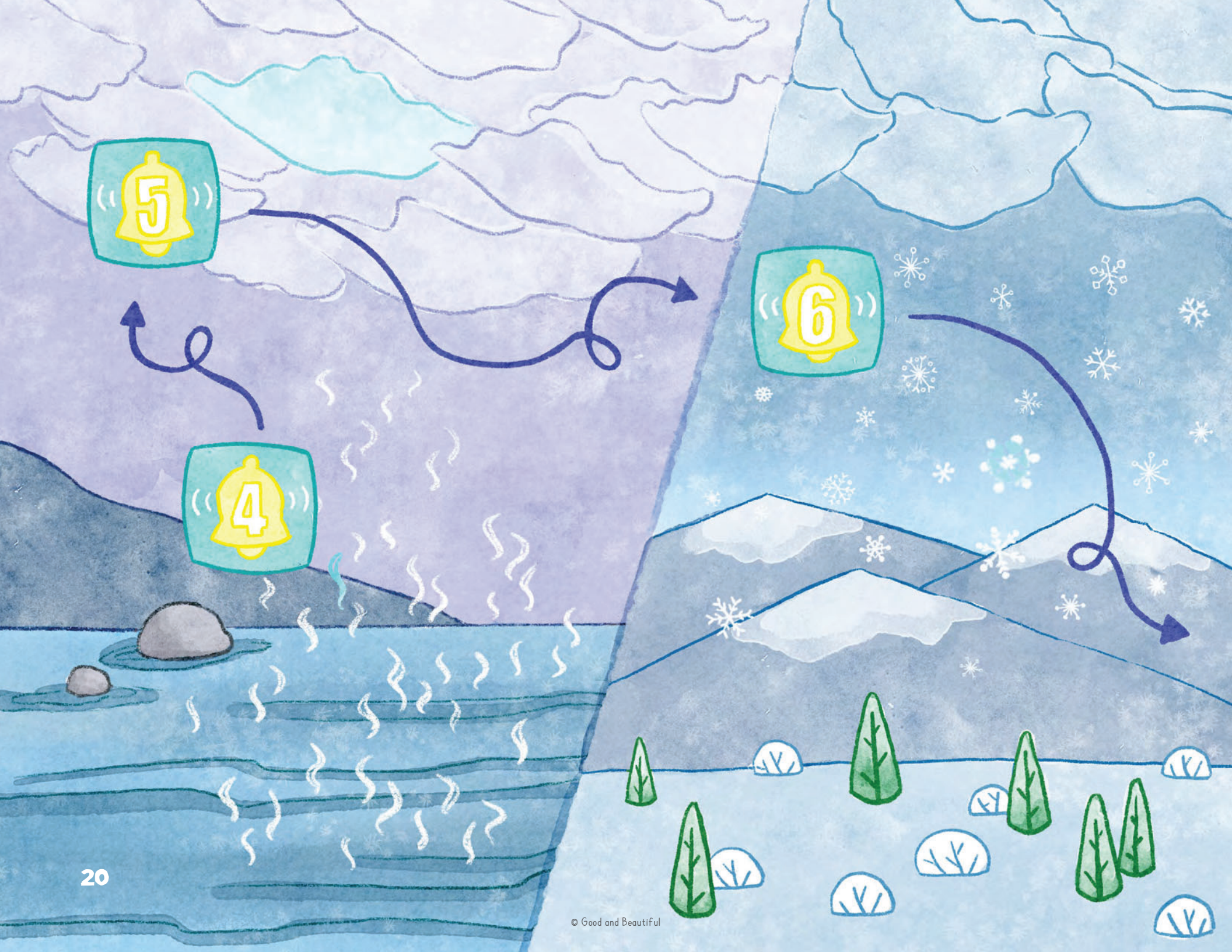
Place a cup of water in front of the child and have him or her take a drink. Read to the child: Where did I just get this water from? **Allow the child to brainstorm and share ideas.** Do you know where it came from before that? **Once again, allow the child to share whatever comes to his or her mind.**

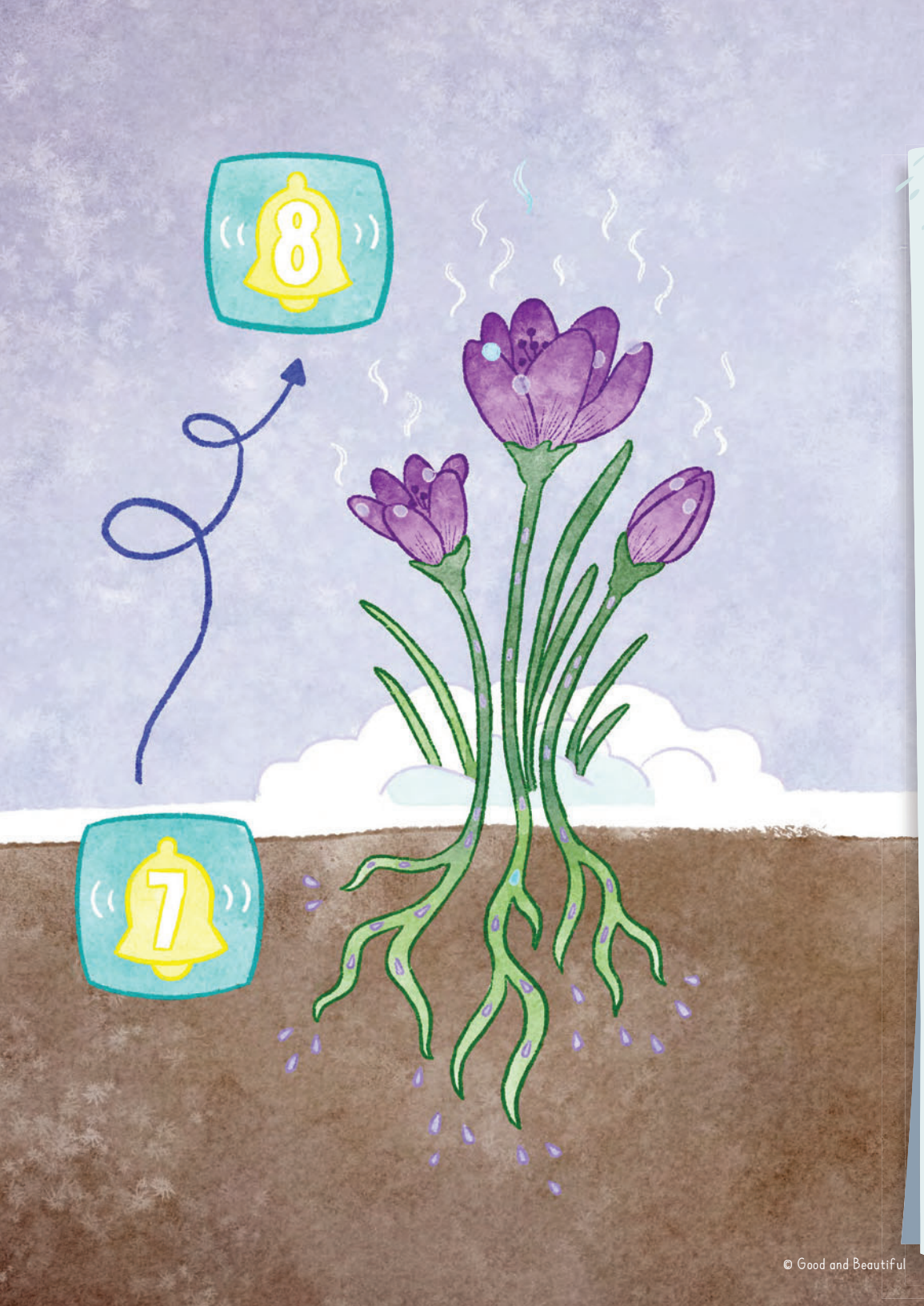
Read to the child: Before drinking water comes through the tap into our sink or is put into a water bottle, it originally comes from a pond, well, lake, or stream. Ponds, lakes, and streams get their water from rain and snow clouds!

Read to the child: The water you just drank is the same water that helped flood the earth when Noah built his ark! I know—it may be hard to understand how that could be. It is all made possible through the water cycle. A cycle is a type of pattern that repeats itself, like the days of the week. **Have the child name the days of the week with you:** Sunday . . . Monday . . . Tuesday . . . Wednesday . . . Thursday . . . Friday . . . Saturday. After Saturday, the cycle starts all over again on Sunday and keeps cycling through. Months, seasons, plant and animal lives, and water all follow cycles.

Audio Narration

Remove the Lesson 4 pawn from the perforated pages at the end of the unit. Listen to the audio narration "The Water Cycle." Have the child start by putting the pawn on illustration number 1 on the next page. When the chime is heard, have him or her move the pawn to the next number by following the arrow. Turn the page when the third chime is heard to continue the narration. Afterward, return to the *Parent Guide* for discussion questions.





Discussion

* Q: What are some forms of precipitation?
* A: Rain, hail, and snow are all forms of precipitation.
* Q: What is evaporation?
* A: Evaporation is when water changes from its liquid form into a gas (or water vapor).
* Q: If you could watch how water behaves in any stage of the water cycle, which stage would you like to watch it in and why?
* A: Answers will vary.

Optional Activity

Fill a large bowl halfway with very warm water and sprinkle a generous amount of salt in it to create an "ocean." (Make the water as warm as possible without burning the skin.) Then float a small container on top of the water in the larger container and cover the whole thing tightly with plastic wrap. Last, place a few ice cubes (representing rain clouds) on top of the plastic wrap so they sit over the small container. Watch the water cycle in action. Help point out each of the steps to the child. The heat causes the water to rise as evaporation takes place, and then it condenses into water droplets as it cools off with the ice. The water that drips from below the clouds is like falling rain. If desired, drink the water that condenses in the small container; it will be fresh water. (The salt is left behind in the "ocean.")

TORNADOES AND HURRICANES

Supplies Needed

Optional Activity

- wide-mouthed water bottle or mason jar with straight sides and a lid
- water
- dish soap

OPENING

Read to the child: Tornadoes and hurricanes are spinning wind storms like the pictures on this page. Tornadoes form over land, and hurricanes form over water. Let's play a game to remember the difference. If I say water, you say "hurricane," and then put your arms out wide and stomp your feet as you turn in a big circle. If I say land, you say "tornado," and then reach your arms up tall and turn in a circle on your tippy toes. **Have the child turn as directed while you alternate saying "land" and "water." Help the child respond with the correct type of storm.**

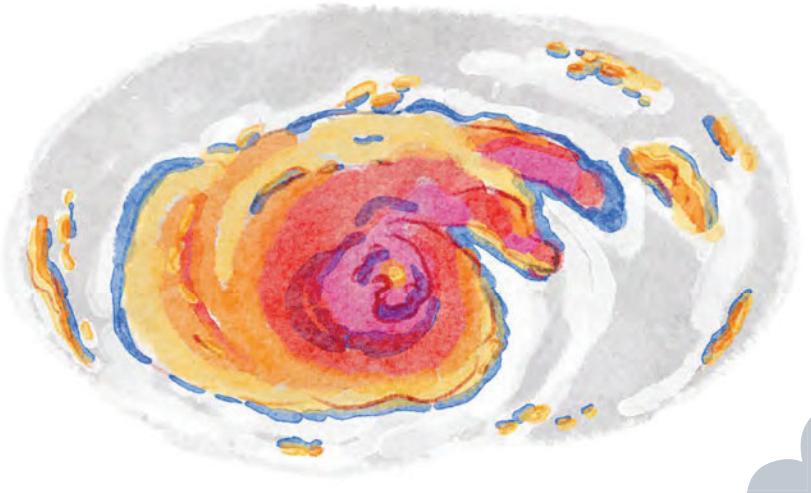
Land = Tornado Water = Hurricane

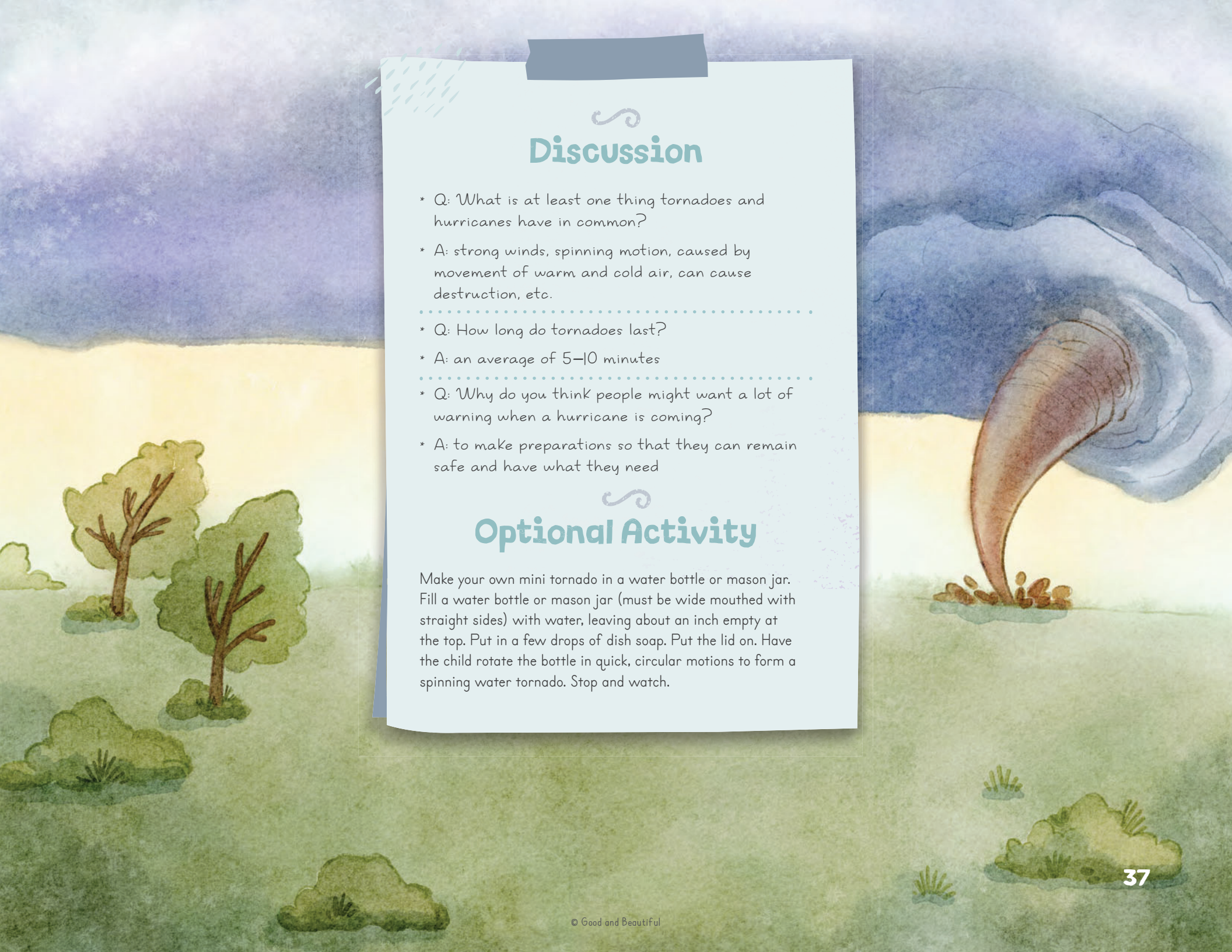
Read to the child: Tornadoes and hurricanes are both weather events that can cause strong winds. Tornadoes form over land and usually don't last very long. Hurricanes form over water and can build up over many days. Sometimes hurricanes move over land, causing a very wet and windy storm that can last several hours or even a few days.

Story Time

Read to the child: Today we are going to read a story about tornadoes and hurricanes to learn more about them.

Read to the child "Hurricane Day" on page 70 of *The Big Book of Science Stories*, and then return to the *Parent Guide* for discussion questions.





Discussion

* Q: What is at least one thing tornadoes and hurricanes have in common?
* A: strong winds, spinning motion, caused by movement of warm and cold air, can cause destruction, etc.
* Q: How long do tornadoes last?
* A: an average of 5–10 minutes
* Q: Why do you think people might want a lot of warning when a hurricane is coming?
* A: to make preparations so that they can remain safe and have what they need

Optional Activity

Make your own mini tornado in a water bottle or mason jar. Fill a water bottle or mason jar (must be wide mouthed with straight sides) with water, leaving about an inch empty at the top. Put in a few drops of dish soap. Put the lid on. Have the child rotate the bottle in quick, circular motions to form a spinning water tornado. Stop and watch.

LESSON 14

LIGHT AND COLOR

Supplies Needed

- red, blue, and yellow crayons
- paper

Optional Activity

- tempera or watercolor paints
- paintbrush
- cardstock or construction paper
- water

OPENING

Give the child red, blue, and yellow crayons and a piece of paper. Draw three lines on your paper with the red, yellow, and blue crayons. Point to each of the colors and tell me some things you can see around you that are that color. Red, yellow, and blue are known as primary colors. All other colors we see come from mixing these colors together. We are going to explore how colors are made and how we see them.

Read to the child: Take a minute to draw a picture with your three crayons on the piece of paper. You can see these colors because of reflecting light. When light shines on an object, it bounces off and into your eyes. Let's find out how this works in our next audio narration.

Audio Narration

Remove the Lesson 14 pawn from the perforated pages at the end of the unit. Listen to the audio narration "Light and Color." Have the child start by putting the pawn on illustration number 1 on this page. When the chime is heard, have him or her move the pawn to the next number by following the arrow. Turn the page when the fourth chime is heard to continue the narration. Afterward, return to the ***Parent Guide*** for discussion questions.

Discussion

* Q: What allows us to see color?
* A: Light gives us the ability to see color.
* Q: How does light travel?
* A: Light travels in waves.
* Q: What is your favorite color? What do you love about that color?
* A: Answers will vary.

Optional Activity

Experiment with creating different colors. Using tempera or watercolor paints and a paintbrush, mix a few drops of two primary colors together on a piece of cardstock or construction paper. What is the result? Give the new color a creative name. Try again with another two colors.

NAMES OF THE OCEANS

Supplies Needed

Optional Activity

- paper
- blue, green, and black markers

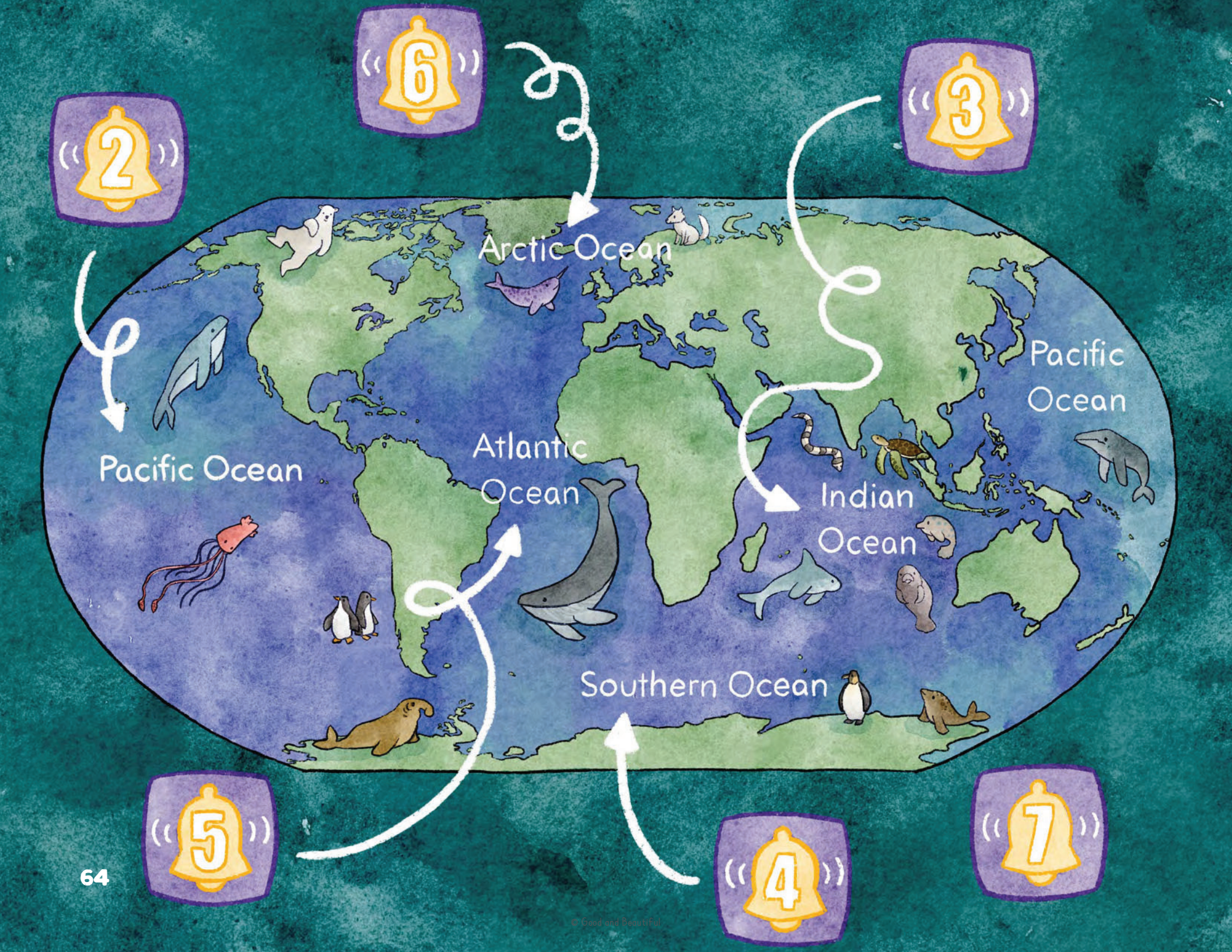
OPENING

Ask the child to pick five letters in the alphabet, then think of names of people that begin with each of the five letters. Read to the child: Just like people have names, the oceans on Earth have names too. The oceans are named the Pacific Ocean, the Atlantic Ocean, the Southern Ocean, the Arctic Ocean, and the Indian Ocean.

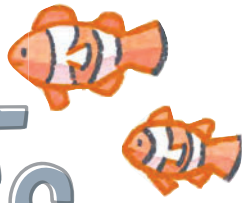
Read to the child: Imagine that you are one of these children in the picture below, standing at the beach, looking out over the ocean. Does it seem really big to you? As you look out over the water, doesn't it seem to stretch on and on and on? Let's listen and learn about the names of these vast bodies of water.

Audio Narration

Remove the Lesson 20 pawn from the perforated pages at the end of the unit. Listen to the audio narration "Names of the Oceans." Have the child start by putting the pawn on illustration number 1 on the next page. When the chime is heard, turn the page and have him or her move the pawn to the next number in counting order. Afterward, return to the *Parent Guide* for discussion questions.



CORAL REEFS



Supplies Needed

- two small items that can be used as game tokens, such as goldfish crackers
- six-sided dice

OPENING

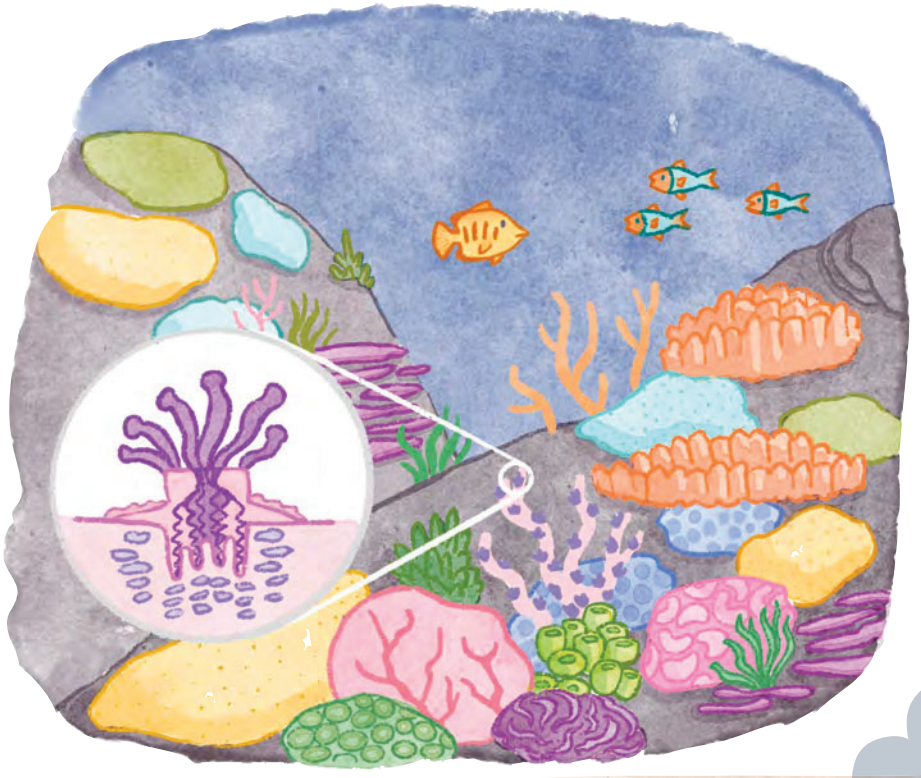
Read the following poem to the child and have the child hold up one finger for each line as it is read. Note: You might want to explain to the child that a coral polyp is a tiny animal with a soft body that can connect with other polyps to form a coral reef colony.

Growing Coral

By Chantelle Ivie

One little polyp beautiful and small.
Two little polyps still not very tall.
Three little polyps start to form a group.
Four little polyps circle in a loop.
Five little polyps join in the throng.
Six little polyps still growing strong.
Seven little polyps spread out near the krill.
Eight little polyps steadfast and still.
Nine little polyps looking like a leaf.
Ten little polyps start to form a reef.

Read to the child: Just like in the poem we read, polyps really do join together one by one to make large coral reefs. Point to the image of the zoomed-in polyp. Each polyp is tiny, just like this one. But over hundreds of years they grow together to form hard, rocklike surfaces made of hundreds of thousands of polyps. Many tiny pieces work together to make a beautiful piece of coral, and this coral is the basis of an amazing home to many creatures. It is called a coral reef.



HARD and SOFT CORALS

Read to the child: Coral can take many beautiful forms, each unique and wonderful. These formations can be sorted into two categories, either hard coral or soft coral.

Point to the hard coral below. Hard corals are named that way because they are hard and solid. They grow in a group, or colony, called a coral head. These colonies live and die together, joining other dead coral to form a rock called limestone. This limestone is the base on which new coral grows, and it can take hundreds of years to form the large coral pieces we see today.

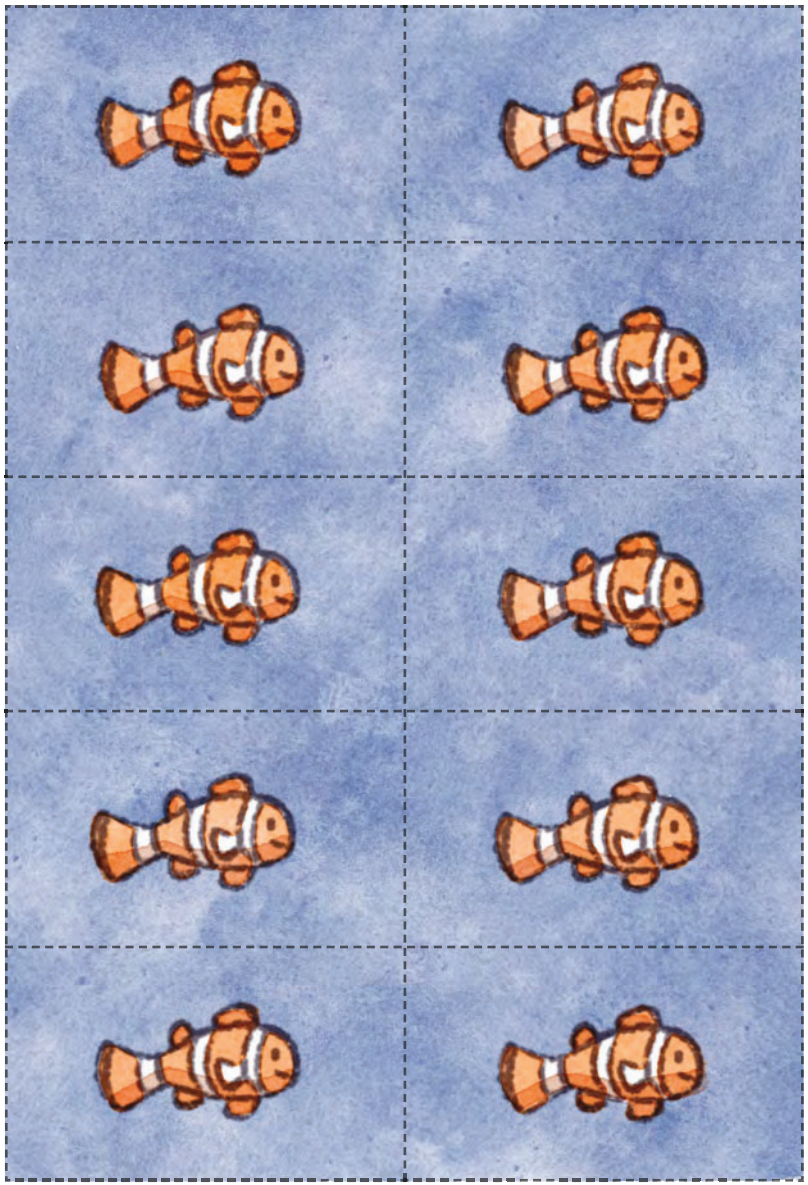
Point to the soft coral below. The other type of coral is soft and sways with the movement of the water. It does not form limestone and is not the base of a coral reef, but it is found growing on coral reefs.

Hard coral forms homes for many different types of animals that live inside a coral reef habitat. The soft coral is one of the animals that lives on the reef, along with fish, sponges, clams, crabs, sea stars, and more. The reef provides everything many animals need to survive, such as food, shelter, camouflage, and safety.

GAME CARDS

NOTE: Continue to the next page where you will be directed when and how to use the game cards.

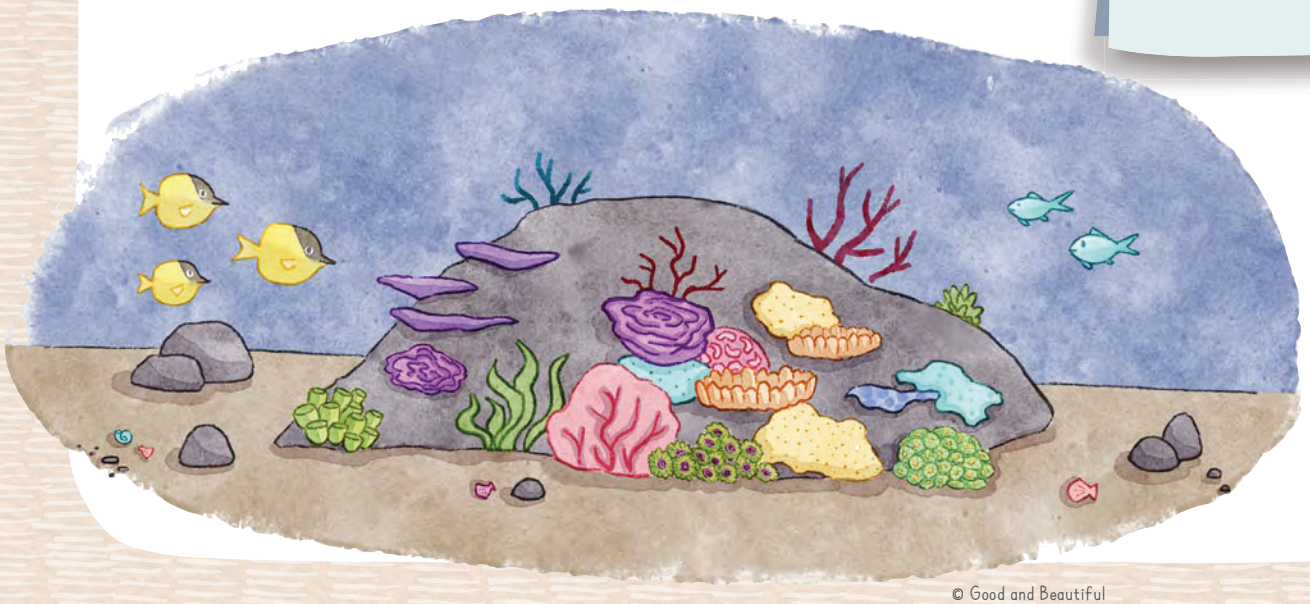
Question Time What two categories are corals organized into? a. strong and weak b. hard and soft	Question Time Hard coral is made up of hundreds of thousands of what? a. parasites b. polyps
Question Time Which type of coral turns into limestone? a. soft coral b. hard coral	Question Time How many polyps grow together to form a coral? a. 10 b. 100,000
Question Time Which animal would you see on a coral reef? a. a tiger b. a fish	Fun Fact Some famous coral reefs are the Great Barrier Reef, the Amazon Reef, the Tubbataha Reef, and the Miami Terrace Reef.
Fun Fact Coral reefs are found near the center of Earth around the equator in shallow, clean ocean waters.	Fun Fact There are more than 800 different kinds of hard coral.
Fun Fact The Great Barrier Reef is so big it can be seen from outer space.	Fun Fact More than 4,000 species of fish make their homes in coral reefs.



Activity Time

Read to the child: Clown fish and sea anemones are two common animals that help each other inside a coral reef. Let's play a board game to help a clown fish get back to his home in the sea anemone.

Have you and the child place the chosen game tokens on START. If teaching more than one child, have a token for each player. Read to the child: Player 1 rolls the dice and moves his or her pawn that number of spaces. If a player lands on a fish space, he or she draws a card. If it is a "Fun Fact" card, read the fact. If it is a "Question Time" card, answer the question. Then it is the next player's turn. The player who reaches the last space first wins the game. **Play the game with the child or children until there is a winner. Note: The correct answer for all cards is option b. If the child answers incorrectly, give him or her the correct answer and continue. After the game is finished, come back to this page and answer the discussion questions together.**



Discussion

* Q: What makes up a coral reef?
* A: limestone formed from dead coral, and a mixture of living hard and soft coral polyps
* Q: Name one difference between hard coral and soft coral?
* A: Answers will vary but may include the following points: Hard corals are hard and solid; soft corals are soft and can sway. Hard corals form limestone; soft corals do not. Hard corals form the base of a coral reef; soft corals live on the base.
* Q: Would you want to visit a coral reef, and what would you hope to see there?
* A: Answers will vary.

Audio Narration Pawns

Lesson 4:
The Water Cycle

Lesson 5:
Clouds

Lesson 14:
Light and Color

Lesson 10:
Names of the Oceans

Audio Narration Pawns

Lesson 22:
Animals of the
Open Ocean

Lesson 25:
Animals of the
Coral Reef

Lesson 28:
Sharks

Science for Little Hearts and Hands

THE BIG BOOK of SCIENCE STORIES

WIND and WAVES

The Good and the Beautiful CURRICULUM

The Good and the Beautiful

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A Day at the NEWS STATION

Illustrated by Shannon Vogus


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Arianna and Carlo were kneeling over their newly finished masterpieces. White, blue, pink, and green chalk powder was sticking to their palms and clinging to their knees as they looked up and saw their mother pulling into the driveway. “Look what I drew, Mom!” shouted Arianna.

“What a beautiful illustration of the atmosphere,” replied her mother.

“I didn’t draw Adam’s ear,” retorted Arianna. “I drew rain clouds,” she explained. “They are going to help Carlo’s flowers to grow.”

“Not Adam’s ear,” Mother smiled, “atmosphere. It is the protective layers of air that surround our planet. All of Earth’s weather occurs within a layer of our atmosphere.”

"Speaking of the weather, is it going to rain soon?" asked Carlo. "Our plants are looking a little thirsty."

"It has been a dry summer, hasn't it? Just before I left work, it looked like that might change soon. We will just have to see how things are looking tomorrow when I return. How would you two like to join me tomorrow at the news station?" Mother offered.

"Really, we could come with you to work?" exclaimed Arianna.

"Yes, yes, yes!" shouted Carlo as he smiled at his mother.

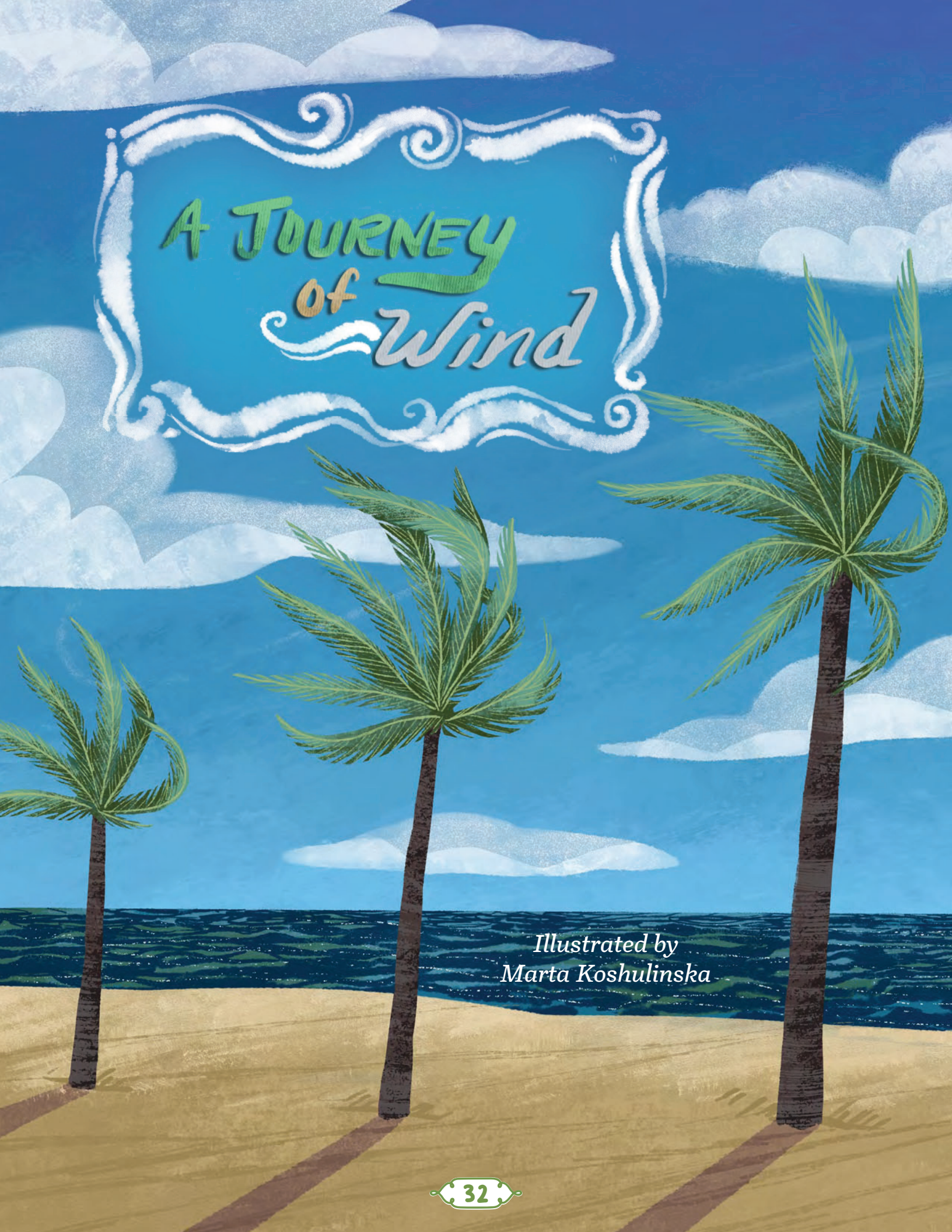
FUN FACTS ABOUT METEOROLOGISTS

Not all meteorologists report weather on TV or other news platforms.

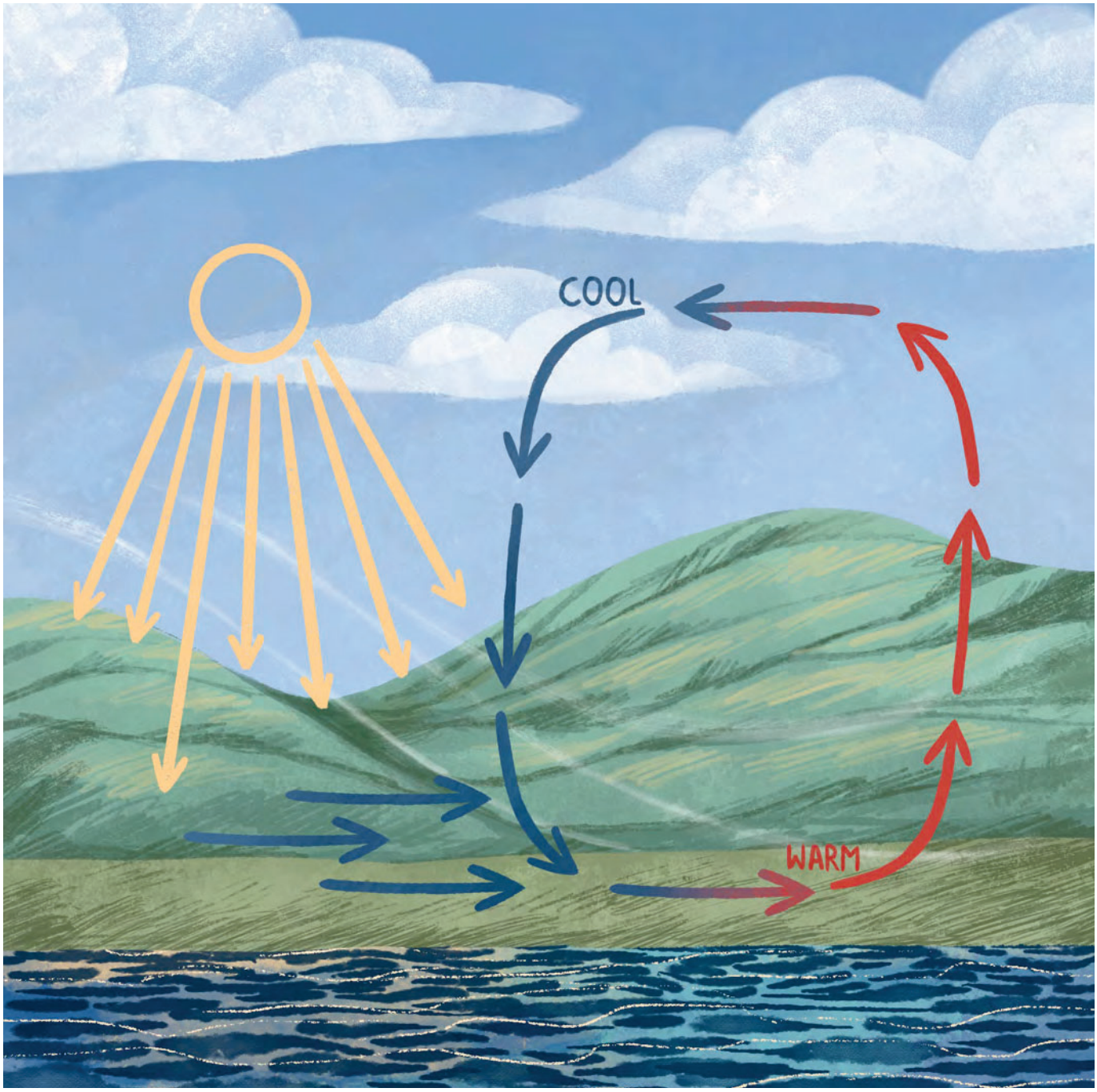
* Some meteorologists simply focus on research and can work for governments, the military, or universities.
* Some meteorologists help to develop better instruments for measuring weather.
* Some meteorologists study changes in climate.

Some meteorologists spend a lot of time sitting in an office working at a computer. But there is also an opportunity for **field work**. Field work means traveling to different locations and often involves being outside, experiencing the weather hands-on.

Weather is the current condition of the atmosphere. The atmosphere has five major layers, but our weather occurs in the lowest layer of the atmosphere, called the **troposphere**.


A Journey of Wind
Illustrated by
Marta Koshulinska

Every day on Earth, winds of different forces and speeds swirl around every surface on land and in the sky. You can't see or hold wind, but you can sometimes hear and even feel it. Wind is an invisible force of nature, but we see its effects all around us.



During the day, air above land heats more quickly from the sun than air over water. Hot air is lighter than cold air, so it rises into the atmosphere, while heavy, cold air rushes in to take its place. The movement of hot air and cold air is what creates wind. The opposite happens at night—air cools faster over land than over water, so the air over water rises, and the air over land sinks and takes its place. Let's follow the wind on a journey to discover more!

Illustrated by Bojana Stojanovic

"Are you ready for some snow?" Kanan's older sister, Prisha, turned to Kanan with excited eyes.

"Yes!" Kanan answered excitedly and looked out the window of his family's red jeep. For miles and miles, he could see evergreen trees and mountains covered in snow. Kanan and his family were driving from the heat of their home state, Arizona, to a winter cabin in Colorado for a vacation. Kanan was about to experience winter and snow for the first time.

Kanan's dad pulled into the driveway of the cabin, and Kanan climbed out, stepping on snow for the first time. Right away, he noticed that it made a crunching sound under his shoes. Looking up, Kanan noticed that snowflakes were falling—much softer and slower than raindrops. As he stood there, snowflakes settled on his shoulders, sleeves, and shoes.

Kanan took a closer look at the snowflakes on his sleeve. The snowflakes looked like lace, with beautiful patterns, and each one was completely different from the others. He wanted to know how the snowflakes could be formed this way, so he went to look for Prisha, who had already taught him all about rain. She wasn't outside, so he went into the cabin.

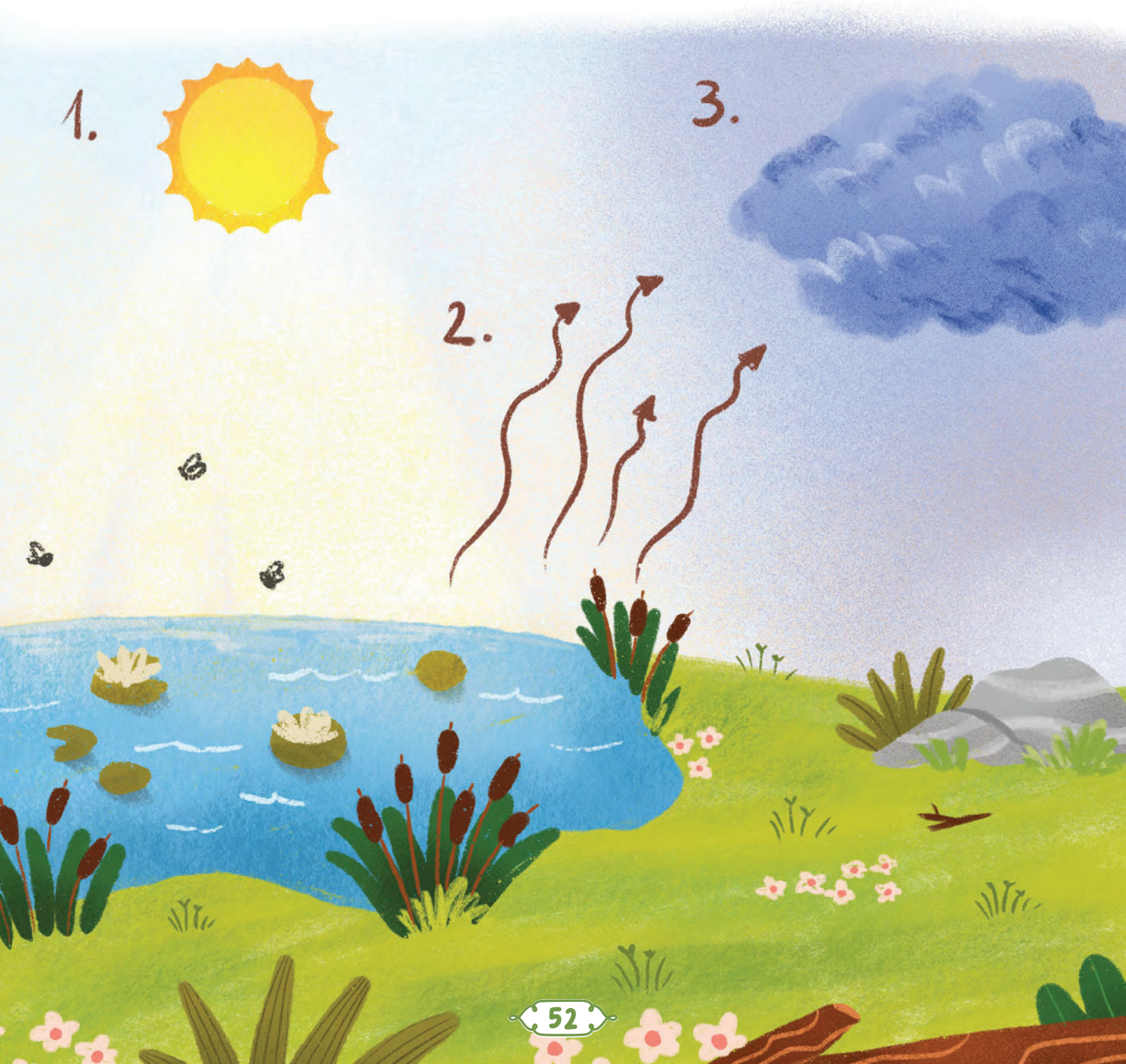
As Kanan walked around the cabin calling for Prisha, he thought back to last summer in Arizona. It had been a hot and dry season, but they did get some big rainstorms from time to time.

On one of those rainy summer days last year, Kanan and Prisha were on the porch enjoying the storm. Kanan said, "Prisha, where does rain come from?"

"Good question, Kanan!" Prisha said. "The sun heats up the water in oceans, lakes, and rivers. The liquid water turns into a warm gas and rises up into the sky. When it gets high, where it is cooler, the gas form of water turns back into a liquid, and the droplets stick together to form clouds. When the clouds get too big and heavy, the liquid water falls back into the oceans, lakes, and rivers as rain."

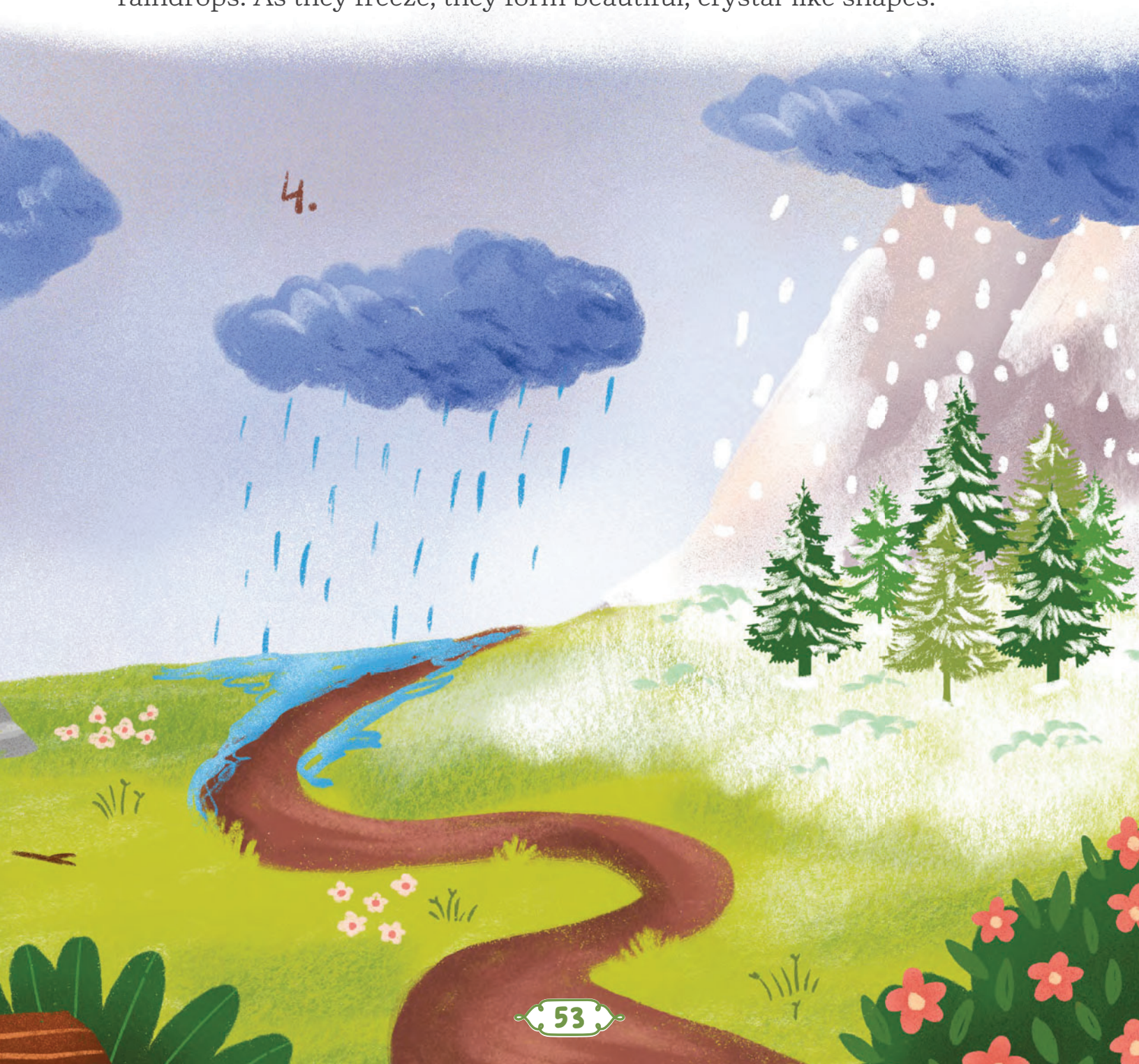
Smiling as he thought about those rainy summer nights, Kanan went into the kitchen and finally found Prisha. “Prisha, how do snowflakes form like this? They’re perfect!” Kanan said as he started to show her his snowflake-covered sleeve. But in the place where the snowflakes had been were tiny pools of water.

Prisha pulled a pair of mittens on her hands and said, “Let’s go back outside. Do you know what snowflakes are made of?”



Kanan thought for a moment as they walked through the winter wonderland. “They must be made from water,” he realized, “because they just melted on my arm.”

“You’re exactly right,” Prisha replied. “Snowflakes are formed from water that has been frozen. Just like with rain, moisture in the air collects in the clouds and makes them heavy. Except in this case, the temperature is much colder, so the water droplets are frozen and fall as snowflakes instead of raindrops. As they freeze, they form beautiful, crystal-like shapes.”



She pointed to a snowflake on one of her mittens. “Look at this snowflake. How many points does it have?” she asked Kanan.

Bending over, he carefully observed the snowflake. “It has six points!” Kanan said.

“Yes,” she replied. “Now, what about this one?” she said, pointing to a snowflake close to the first one.

Kanan shifted his gaze and began quietly counting: “One, two, three . . . four, five, six. Hey!” exclaimed Kanan. “That one has six points, too! Do they all have six points?”

"They do," answered Prisha, "and if you compare each snowflake, you will notice that they are all different. No two snowflakes are exactly the same. Take a look."

Kanan brought his face as close as possible and peered at several snowflakes covering her mitten. "Prisha, you're right! None of them are exactly the same!" he exclaimed. "They all have different patterns and shapes."

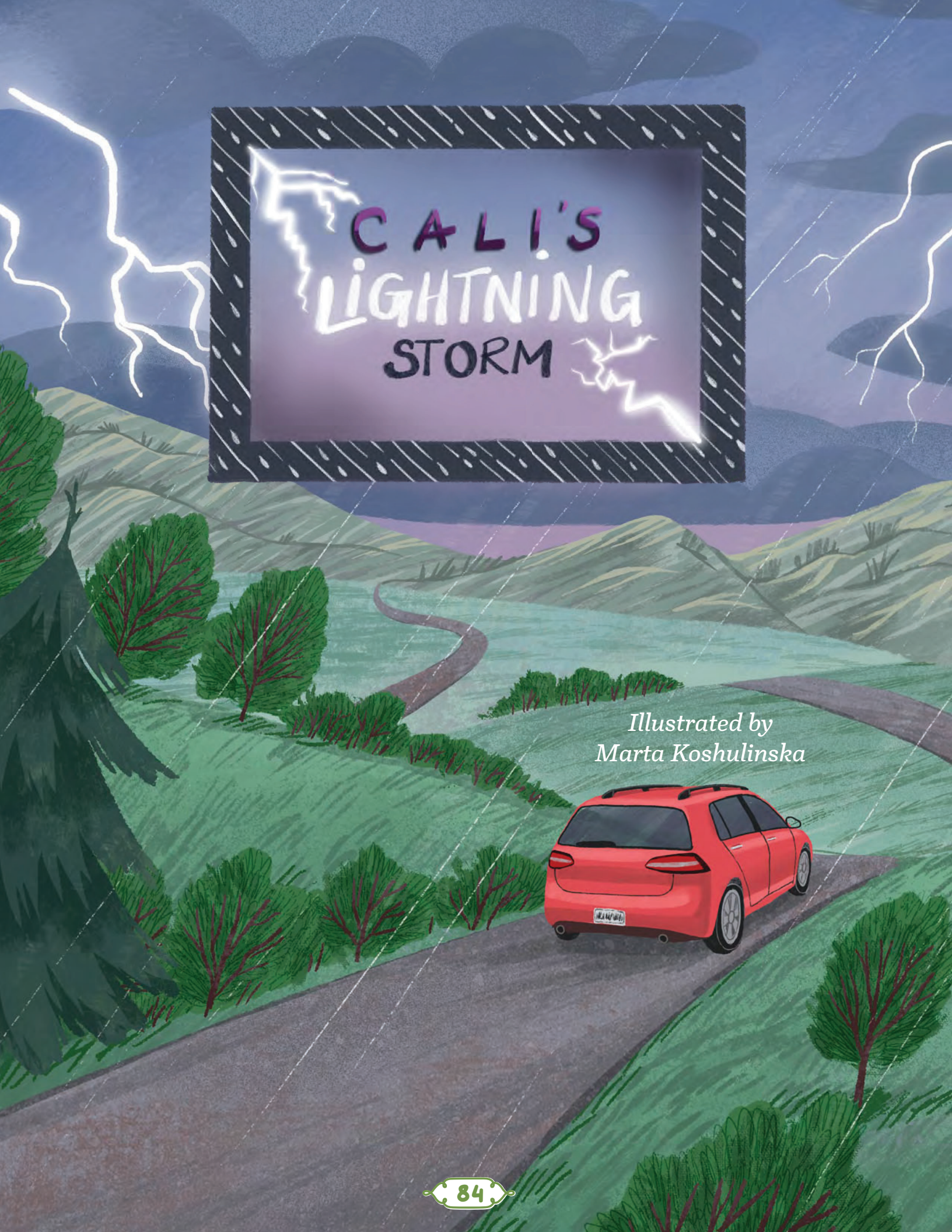
The next morning as soon as breakfast was over, Kanan and Prisha grabbed their new snow gear and bundled up to explore the wintry wilderness around them. The snow had stopped falling from the frosty blue sky, and the air was crisp and cold. Kanan and Prisha spent the entire morning figuring out how to roll snowballs, and they made three big ones to stack on top of each other to make a smiling snowman. What fun they were having!

Cold, wet, and hungry, they went back inside the cabin, ready for a meal and to tell their mom all about their time in the snow. “Mama, we made snowballs and built a snowman!” Kanan exclaimed.

“That sounds like a great time!” Mama replied. “Isn’t exploring in the snow delightful?” she asked.

“Yes! It’s so different from Arizona,” Kanan exclaimed, “but I really like it!”

After lunch, Kanan sat by the window, looking out at the snow shimmering like diamonds. His heart swelled with joy that God made such a beautiful world, from the lovely summer rainstorms to the delicate, lacy snowflakes.



Illustrated by
Marta Koshulinska

"Look, Abby!" giggled Cali. "My hair stands up when I go down the slide."

"I want to try," laughed Abby as she hurried up the steps to the tunneled slide.

"Wee!" her voice echoed through the slide. "Oh, ouch!" Abby squealed.

"What happened?" asked Cali as she hurried over to check on her friend.

"I'm okay. It just felt like the slide gave me a little sting," said Abby, her hair also standing up.

"That's happened to me before, too," responded Cali.

"Everything okay?" asked Abby's mom.

"Yes," called the girls in unison.

"The slide just shocked me," explained Abby.

"Yes, it does look like you have built up quite an electric charge," smiled her mom. "That is an impressive hairstyle you've got there."

Abby and Cali giggled. "We thought so, too," said Cali.

"Did you know that the electric shock you got from the slide was made from the same thing that makes your hair stand up?" questioned Cali's big brother Carson, who was playing marbles with Abby's brother. "It's called static electricity."

"What's static electricity?" asked Cali.

"Everything in our world is made up of teeny, tiny atoms, and these atoms have positive and negative charges inside them. The particles inside the atoms that have a negative charge are called electrons. Let's pretend that all the red marbles are positive and all the blue marbles are negative," said Carson as he paired up each of the red and blue marbles that he had been playing with and divided them into two groups.

"When movement between two things happens—like your sleeve rubbing against the side of the slide—some of the electrons move from the atoms in the slide to the atoms on your sleeve. See?" said Carson as he adjusted the marbles.

"Now this group of atoms on your sleeve has way more negative electrons than it had before, and the slide has a positive charge. The thing about electrons is they like to stay balanced, so when a negative charge gets a chance to pull back together with a positive charge, it will. When that happens, a small bolt or spark of electricity often occurs," explained Carson as he moved the blue marbles back to their red pairs.

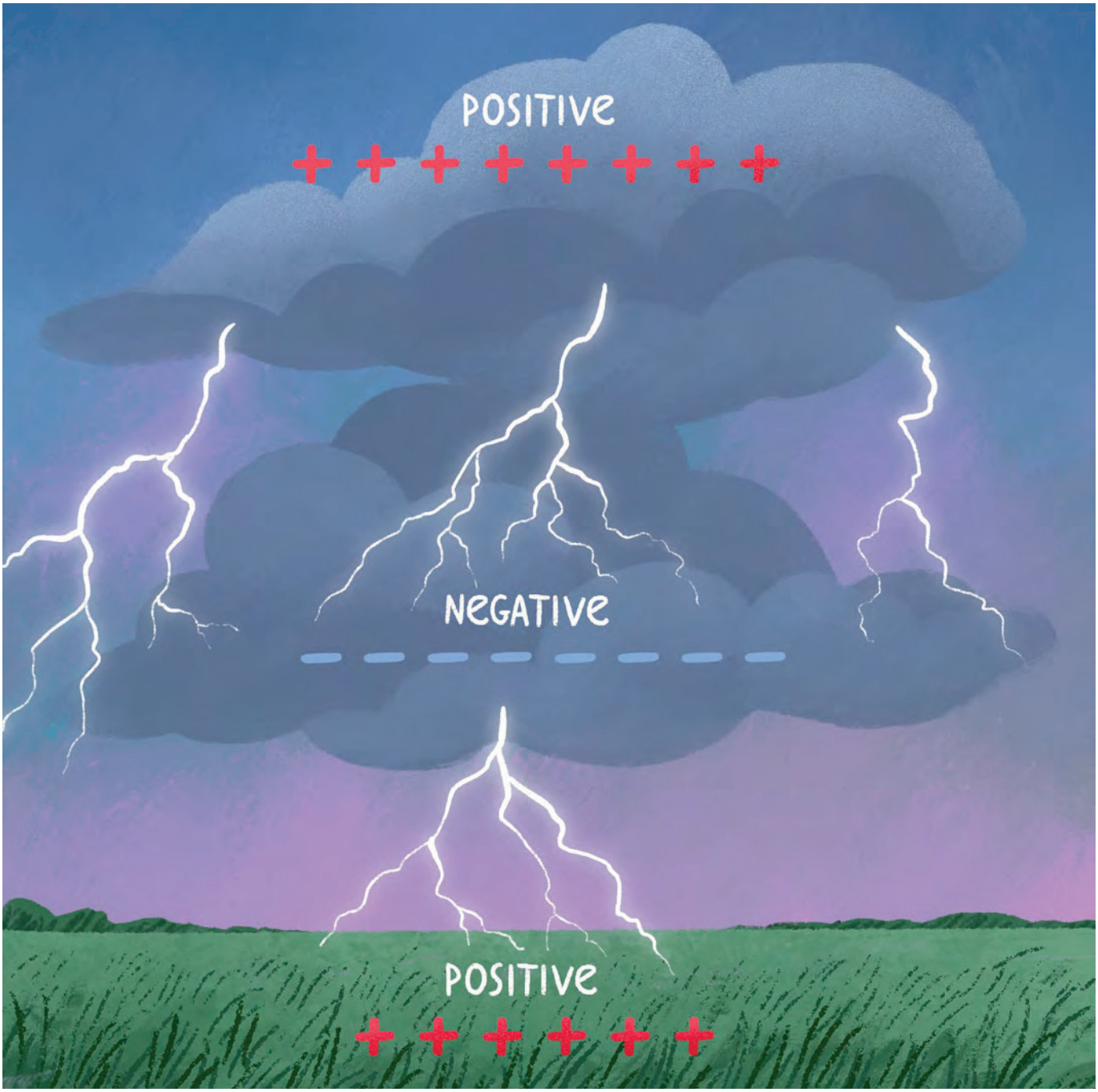
Thunder rumbled in the distance. “Speaking of static electricity, I just heard thunder, so it’s time to head home,” said Cali’s mom.

“Okay. Bye, Abby! See you tomorrow,” called Cali.

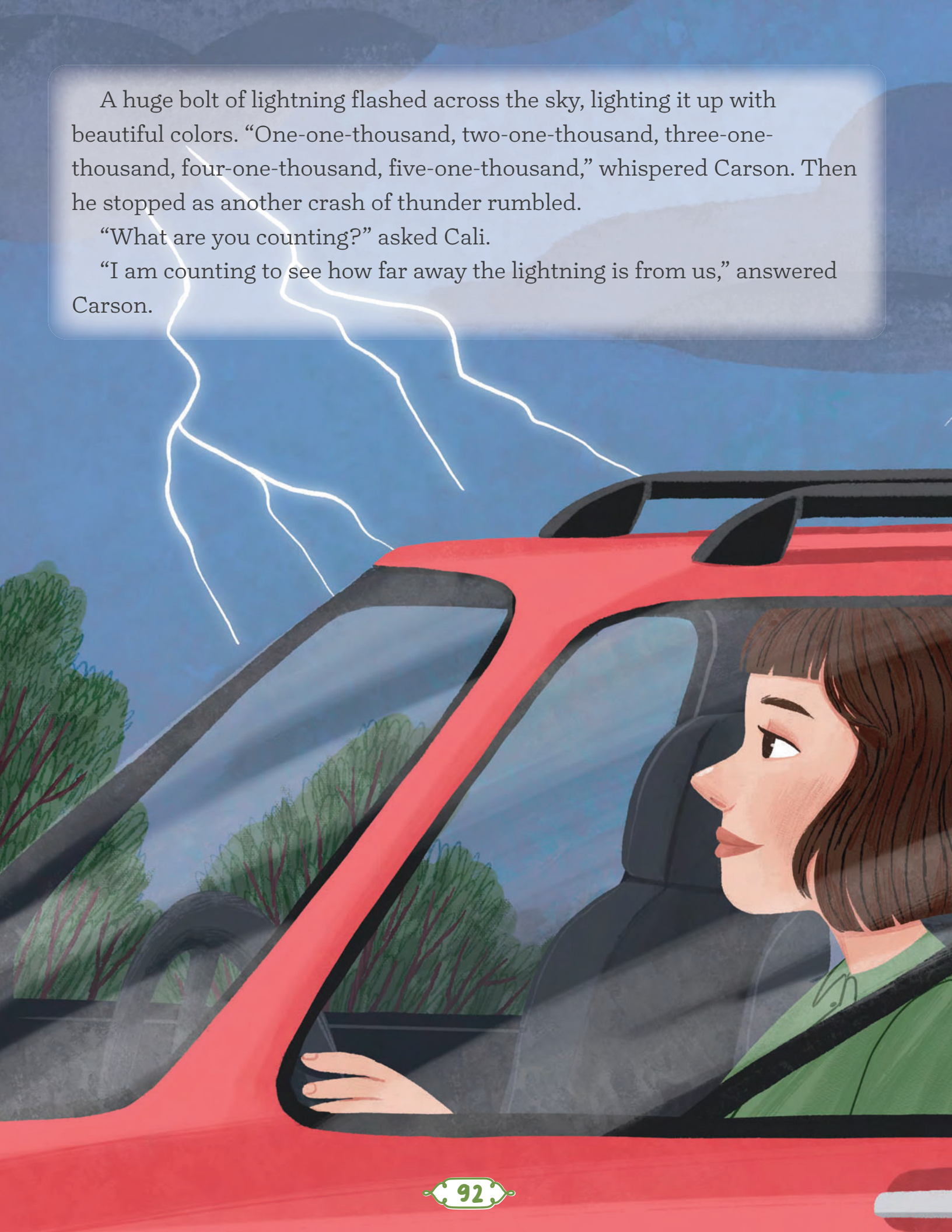
As she walked with her family to the car, Cali questioned, “What does static electricity have to do with thunder?”

“When you hear thunder, it always comes with lightning because thunder is the sound that’s made when lightning strikes,” explained her mother, “and lightning is static electricity, only on a much larger scale.”

“Really?” wondered Cali.



"When thunderclouds form, there are tiny ice crystals that move around in the cloud. When these little ice chunks bump into each other, it causes the negative particles to jump to the other ice crystal, leaving some ice crystals with negative charges," explained Carson. "But as you know, the particles don't like staying separated like this, so eventually, the ice crystals with the negative charge will pull toward positive charges from other ice crystals, the air, or the ground to find balance. When they do, lightning occurs."



A huge bolt of lightning flashed across the sky, lighting it up with beautiful colors. “One-one-thousand, two-one-thousand, three-one-thousand, four-one-thousand, five-one-thousand,” whispered Carson. Then he stopped as another crash of thunder rumbled.

“What are you counting?” asked Cali.

“I am counting to see how far away the lightning is from us,” answered Carson.

"Did you notice that we saw the lightning before we heard the crash of thunder?" asked Carson.

"Yes," said Cali.

"Thunder and lightning do occur at about the same time, but sound travels more slowly than light. So the farther away we are from a bolt of lightning, the longer it takes for us to hear the thunder that comes with the bolt. We can estimate that every five seconds we count is equal to about 1.6 km (1 mi)," explained Carson.

"Sometimes the loud booming noise makes me feel so nervous," admitted Cali.

"I understand," responded her mother. "Lightning is powerful and can be dangerous if you are outside. It can strike the ground or other objects around you. If you are inside, then you are safe. That's why it's always best to get inside a building or a car during a lightning storm."

Cali pressed her face up against the window as another bright light danced across the sky. "I guess lightning is quite beautiful," she said, "especially if I know I am safe."

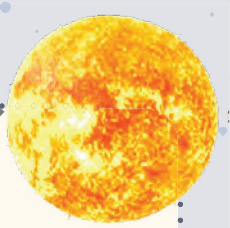
FUN FACTS ABOUT THUNDER AND LIGHTNING

Cloud-to-ground lightning is when the negative charges are at the bottom of the cloud, and the positive charges are on the ground. Lightning strikes from the cloud down to the ground.

In **cloud-to-cloud lightning**, a cloud with a negative charge finds a cloud with a positive charge, and the lightning travels between the clouds.

Cloud-to-air lightning happens when air particles with a negative charge become attracted to cloud particles with a positive charge. These strikes make for some loud thunder, but they do not hit the ground.

Lightning bolts reach temperatures of 27,760 °C (50,000 °F), which is hotter than the surface of the sun!

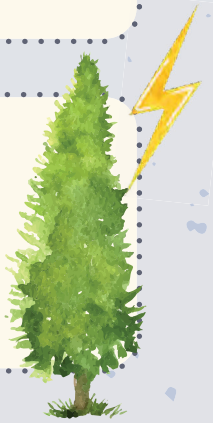


The heat that is produced by a lightning bolt is what causes thunder. Hot molecules take up a lot more space than cold molecules. So when a hot bolt of lightning strikes through the sky, those hot molecules shove the cold molecules out of the way. This dramatic movement of molecules produces the booming sound that we hear.

Lightning can strike the same spot more than once, and it can also strike more than one place at once.

Researchers believe most lightning bolts are about 2.5 cm (1 in) thick.

Lightning will most often strike at water, trees, or tall metal poles, so if you are unable to get inside, at least be sure to stay away from these things during a thunderstorm.



GREAT BLUE HERON'S HOME

On this beautiful morning, the sun warms my feathers and wakes me. I open my eyes, ready to start a new day. Because I am a great blue heron, I sleep high up in a platform nest I built with large sticks. Stretching my long, skinny legs, I stand and take a look over the side of my nest at the marshland below.

On a usual day, I can easily find the food I need in and around this marsh. It is home to many different kinds of animals and plants that live and thrive in water. Sometimes the water in the marsh is more salty (salt water), and sometimes it is less salty (fresh water).

Now that I am full, I fly inland along a river that drains into the wetlands. Salmon swim down below, and a furry brown beaver sits at the edge of the river, holding on to a birch branch. Presently, I come to a small lake with more aquatic life. My eyes are drawn to a bullfrog resting on a lily pad and another frog hiding in the algae at the edge of the marsh, laying her eggs in a safe place. A water snake slithers along the shore of the lake just as a bald eagle swoops down to snatch a large fish out of the water.

Normally, I might try to make a meal of the frog or snake; however, I have eaten plenty of fish and am only thirsty. I lower my bill to the water, scooping up as much fresh water as it can hold, and swallow the water down. Stretching my wings, I lift myself into the air and head back toward the marshy wetlands.

Upon arriving at the wetlands near my nest, I land on a large tree branch. From here I can view the ocean. It is also home to many different forms of aquatic life, from the smallest microscopic animal—called zooplankton—to the largest animal on Earth—the blue whale. Zooplankton and phytoplankton—tiny, microscopic algae—both provide food for aquatic ocean animals. This means that some fish I love to eat grow strong and healthy by eating tiny animals and plants like plankton!

Along the coast nearby is a reef that I have flown over many times. This reef is home to many different species of fish and other marine animals and plants—those that live and thrive in a saltwater environment. Colorful coral feed on zooplankton and provide shelter for other animals, such as seahorses and clownfish. Fish of all sizes and colors, sharks, sea turtles, and octopuses visit coral reefs to find food. I don't usually feed in the reef, but I will catch fish on the coast wherever it is shallow enough to stand.

FUN FACTS ABOUT SALT WATER AND FRESH WATER

A body of water is considered **fresh water** if it has a very low amount of salt. Most rivers, streams, lakes, and ponds are freshwater.

Only a tiny bit of the earth's water is fresh water. However, it is home to almost half of all fish species.

Salt water has a high content of salt. All ocean bodies contain only salt water. Wetlands, like marshes, can have either fresh water or salt water.

Rivers are an important part of keeping salt levels in lakes low. The flowing water takes all the salt away from the lakes. If a lake does not have flowing rivers, all the salt stays in the lake and builds up to have more salt than the ocean. The Great Salt Lake and the Dead Sea are great examples of salty lakes.

Phytoplankton are found in both fresh water and salt water. Not only do they provide food for aquatic animals, but they also produce oxygen through a process called photosynthesis. In fact, it is estimated that phytoplankton produce up to half of the oxygen we need!

PHYTOPLANKTON

Seaweed may not look very appetizing, but humans can and do eat seaweed and other aquatic plants! Certain varieties of seaweed found in salt water are high in iodine, an essential nutrient for our bodies. **Kelp** and **algae** are two other types of aquatic plants that are edible and can provide vitamins and minerals that our bodies need.

SEAWEED


BEACHES
in Brazil

Illustrated by
Natalia Grabtsova

Many people in Brazil speak Portuguese. Here are a few words you can learn.

Olá [oh–LA] = Hello
Mapa [MAH–pa] = Map
Oceano [oh–see–AH–no] = Ocean
Peixe [paysh] = Fish

Olá! My name is Ana, and I am a cartographer from Rio de Janeiro, Brazil. What do I do for a living? If you guessed that I make maps, then you would be correct. Cartographers make maps of all kinds of places, but I love making custom maps of Brazil, and I especially love to map shorelines.

The beauty of the sea draws people to the coasts. The view from the land can be magnificent, with the crashing of the waves and the tiny grains of sand squishing between your toes. All over the world, people gather at the coasts, coming together to be near the water.

Not all coasts look the same, though! There are many unique kinds of shorelines. Take a trip with me down the coast of Brazil, and let's check out some of the local beaches.

Our first stop is Praia das Fontes [PRY–uh daas FON–ches]. This impressive beach has tall cliffs reaching toward the sky. Shorelines with cliffs are often caused by erosion, which is where the water takes bits and pieces of rock and sand away with it. Waves chip away at the rocks, slowly carving out the cliffs. Let me take down a few quick measurements, and we will be off to our next coastline.

Let's head a little farther south to Piscinas Naturais do Pratagy [pih–SEE–nah NAH–toor–ice due PRAH–tuh–gee]. If you step off the beach into the water, you will find yourself in natural pools that are part of a coral reef. These pools are full of wildlife, such as fish, lobsters, seahorses, corals, and sea turtles. I'm going to hop in and find a few animals to draw on my map of this amazing place.

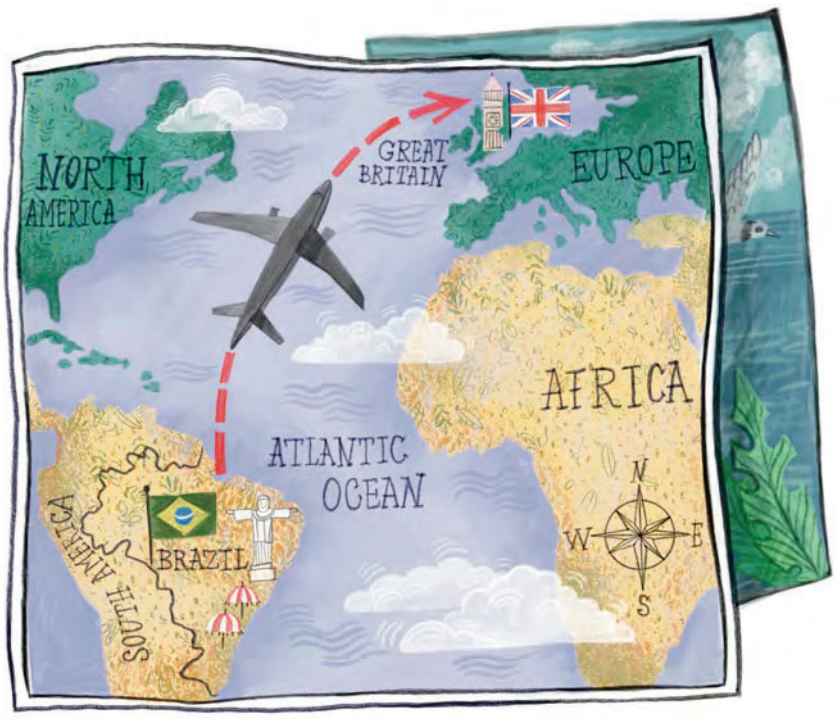
Thanks for waiting. I got some colorful pictures. What animals do you think I should include on my map?

Hold tight as we travel on to Lopes Mendes [LAW–pees MAIN–gees] Beach, which is a beautiful, sandy beach.

Beaches like the one we see here are formed over many, many years of deposition, which is where the water drops off the bits and pieces it has picked up. On this beach small pieces of rock, shells, and coral have been left behind by the waves, which then crush the pieces into sand. Let me measure the length of this beach before we move on.

Our next stop is a wetland coast. Wetland coasts are often formed as the sea levels rise and water flows over part of the land where plants or grasses live. One beautiful wetland coast is located at Lagoa do Peixe [lah–goh–AH due paysh] National Park. Here, fresh water and salt water mix together, creating a perfect home for certain types of fish. It is also an important location for many kinds of birds that fly south for the winter. How many different kinds of birds can you spot here?

Thank you for joining me on my mapmaking exploration. I'm going to go work on my map, but while I'm at it, why don't you take a look at one more kind of beach that is far away from my home in Brazil?



I've always wanted to travel to visit a beach like the one in this picture. It is a shingle beach in England, formed by many pebbles. Closer to the water, the rocks are small. As you walk away from the water, you'll notice that the rocks get bigger.

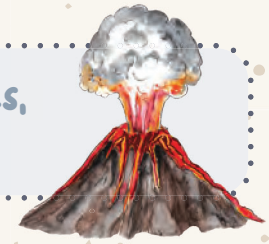
I love studying the beauty and diversity found on each type of beach: cliff, coral reef, sandy, wetland, and shingle. Each coast is formed by the forces and rocks around it. Check out the quick sketch I made for you—a map of our trip. I will go back and add much more detail to my real map, but I thought you might want to keep this one. Thanks for adventuring with me!


ACHES IN BRAZIL

FUN FACTS ABOUT BEACHES AND SHORELINES

Coast: the place where the ocean meets the land
Shore: the place where lake water meets the land
Bank: the place where river water meets the land

Coasts can be affected by things such as waves, volcanoes, and changes in sea level.



Coasts are always changing. Even the smallest wave moves a few pieces of sand. The changes may seem small, but over time, big changes are made.

When **erosion** happens on the coast, it can uncover all kinds of interesting items, from shells to ancient fossils.

Coastal erosion not only shifts the land, but it can also create formations, such as bays, coves, sea caves, and arches.

Lagoons, or ocean lakes, are formed when parts of the shorelines are eroded away, creating a shallow bowl in the seafloor. Ocean water creeps into the bowl and is trapped there by coral reefs or sandbars.

Another interesting formation caused by deposition is called a **spit**. It is a long, thin stretch of beach that reaches far out into the ocean.

Throughout history, people have built their homes near coasts for easy access to water, fishing, and opportunities to travel by boat.

In the United States, many people have to travel for hours by car over many hundreds of miles to reach a coast, but in the United Kingdom, no one lives more than 129 km (80 mi) from a coast.


IN THE
OCEAN
DEEP

Illustrated by Yana Zybina

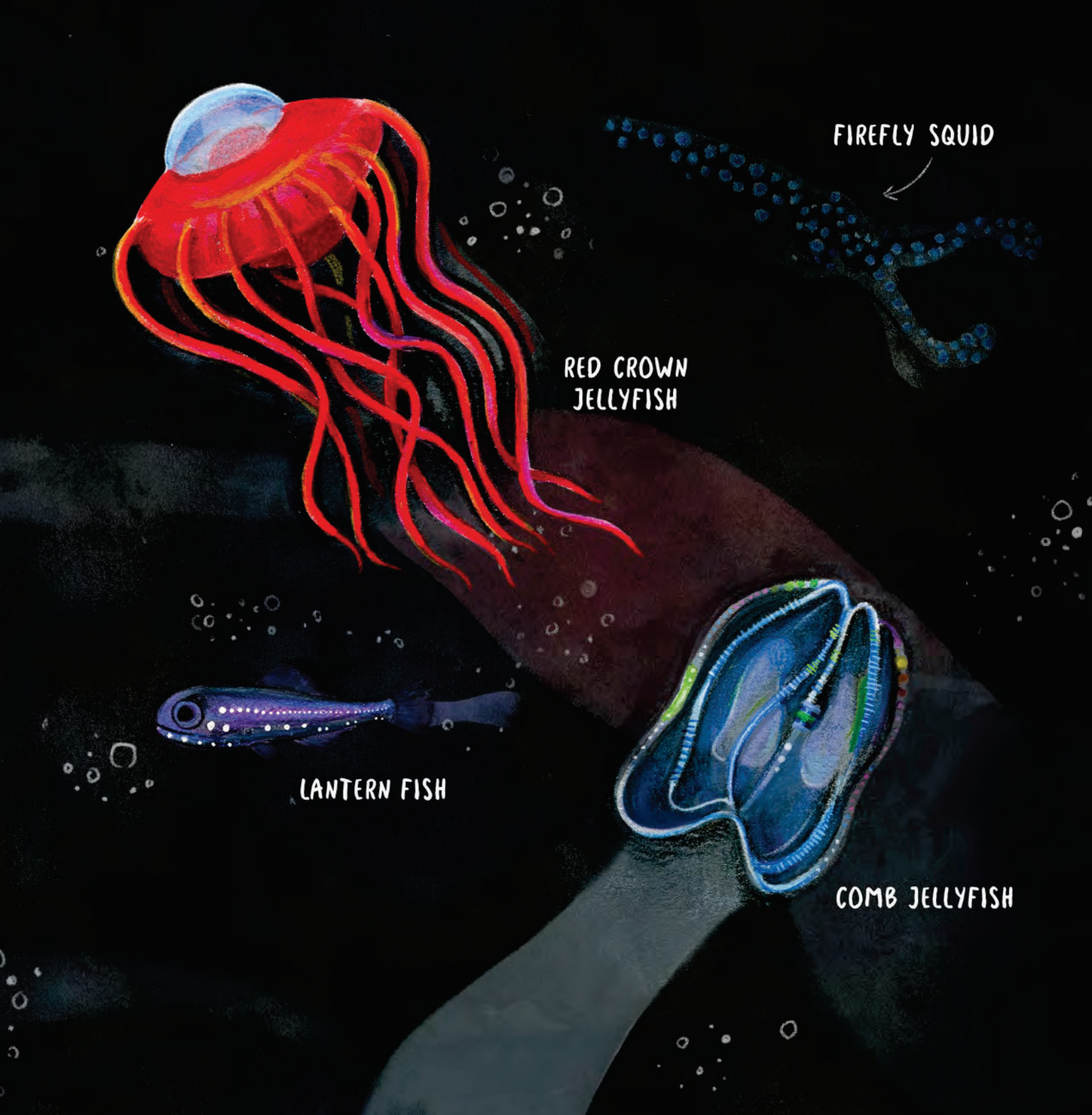
Deep in the ocean, it is dark and cold. Despite the darkness, many creatures live here, including this tiny octopus that has just hatched. She has a pale-pink body with eight arms and two large fins on her head that look like ears. She stretches her fins and begins swimming for the first time. She is a mysterious deep-sea creature—a dumbo octopus.

This dumbo octopus is on her own from birth. Thankfully, she lives deep enough in the ocean that she won't be hunted by very many predators. In fact, she lives deeper down than any other type of octopus. Because of this, she has no need for an ink sac for defense.

Swimming around her in this dark, cold home are many animals with special abilities that help them survive. Some of them, like the vampire squid, have soft, squishy bodies to be able to withstand the intense water pressure of the deep. If they went up to the water's surface, their bodies wouldn't work properly!

The dumbo octopus swims around and forms her body into almost any shape she wants. Her body's jellylike texture keeps its shape as she moves—thanks to the water pressure. She moves about freely, and when she spreads her webbed arms into the water, she looks like a floating umbrella!

She will spend the majority of her life near the seafloor, searching for food. She can't see very well, so she relies on the senses of the suction cups on her arms to find prey. As she hunts and finds her favorite food, she swallows it whole. Copepods or isopods—tiny ocean creatures—become a meal for her.

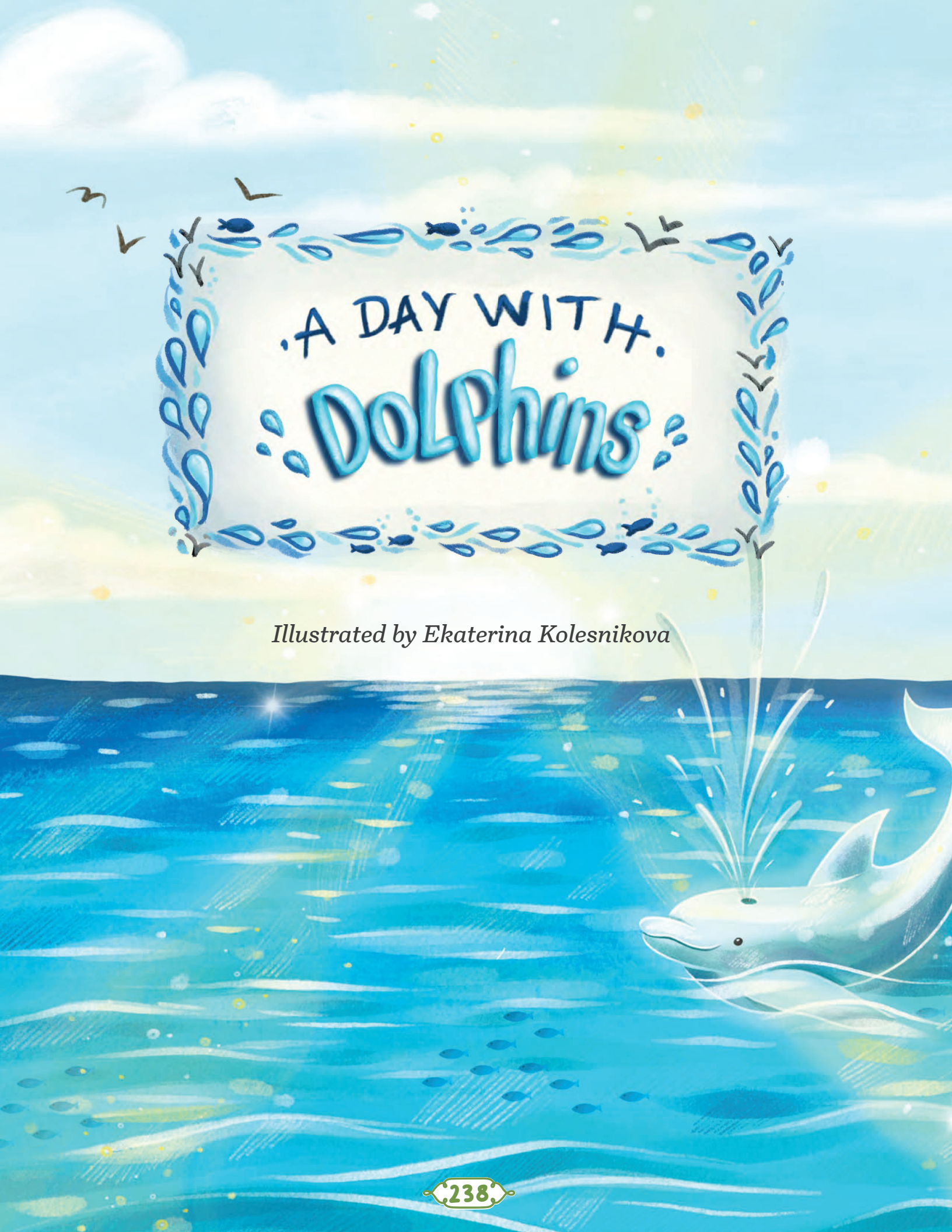


All around her, animals and fish swim around and communicate in different ways. Some have a special chemical in their bodies that allows parts of them to glow like little light bulbs. This is called bioluminescence. A deep-sea animal, like a comb jellyfish, may do this to attract prey, distract a predator, or find a mate.

While the dumbo octopus searches and finds her meals near the seafloor, other animals in the deep ocean eat marine snow. Marine snow is created when ocean plants and animals die and begin to sink. As they sink, they collect other tiny pieces of sand or other small items in the water and grow larger.

This creates little “flakes” that resemble snow as they float gently down through the water. They look like a fluffy snowstorm in the middle of the dark ocean! Marine snow provides necessary food for many animals living in the deep.

As she stays deep down in her ocean home, the dumbo octopus will continue to hunt and search for prey while surviving among the other creatures of the deep. Living in the dark isn't easy, but she was perfectly created by God to be able to survive right where she is.



Illustrated by Ekaterina Kolesnikova

One sunny spring day, Toby's mom pulled the family van up to the entrance of the Marine Mammal Rescue Institute.

"Here we are!" Mom exclaimed. "Make sure you stay with Dad and me so we can all keep together."

Toby and his cousin Tyler looked at each other and smiled. They had been awaiting this trip for months! They had learned all they could about the Marine Mammal Rescue Institute. Here, scientists and biologists study all types of marine mammals and work to help animals that are injured. Toby unbuckled his seatbelt, then reached over to help with the younger children.

The children were brought to a changing room to change into bathing suits, then stepped outside into the park.

"Hello, kids!" a park worker said. "My name is Emily. I am a trainer, and I work to help our injured animals. Today you are going to meet some of our dolphins! Follow me!" Emily turned and led the way to a large pool.

Splash! As the children came close to the pool, a wave of water suddenly sprayed them. Emily laughed and said, "That was Marco. He is our friendliest dolphin, and that is how he says 'hello.'" A large gray dolphin swam over to the side of the pool and put his head above the water, his mouth slightly open. Toby and Tyler thought he looked like he was smiling.

"Marco loves kids. Would anyone like to touch him?" Emily asked.

Toby immediately raised his hand. "I would like to, please!" he said.

"Me, too?" whispered little Amy as she stayed shyly by Toby's side.