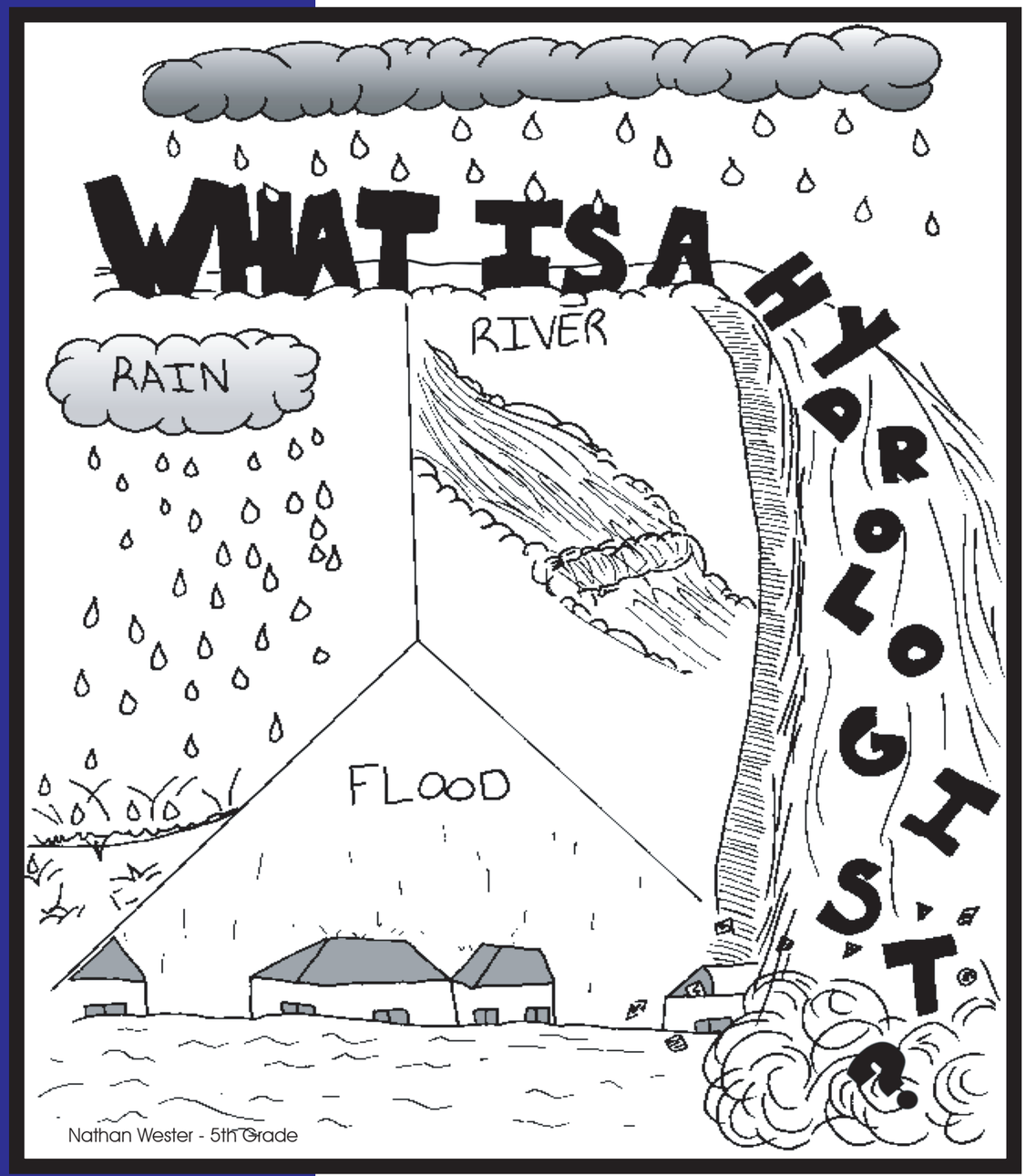

National Weather Service
Southeast River Forecast Center
Peachtree City, Georgia

What Is A Hydrologist?

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Mary and her twin brother, John, were getting ready for school when their Mom told them that school was closed today. They were very excited at this news and jumped around the room before either one of them thought to ask why.

“Why don't we have to go to school today, Mom?” asked Mary.

“Because the storm last night washed out the bridge,” said their mother, as she went to make their breakfast. Mary and John followed her into the kitchen and began to ask about what had happened.

“What does washed out mean, Mom?” asked Mary.

“Well, did you hear the storm last night?” asked Mom.

John said, “I remember that the rain and thunder woke me up.”

Mary was excited and said, “I couldn't sleep very well, either, with the noise outside. Mom, did I hear a tree fall in the front yard?”

Mom answered, “No, Mary, not the whole tree, but a big branch fell off the top of the tree and almost landed on our roof!”

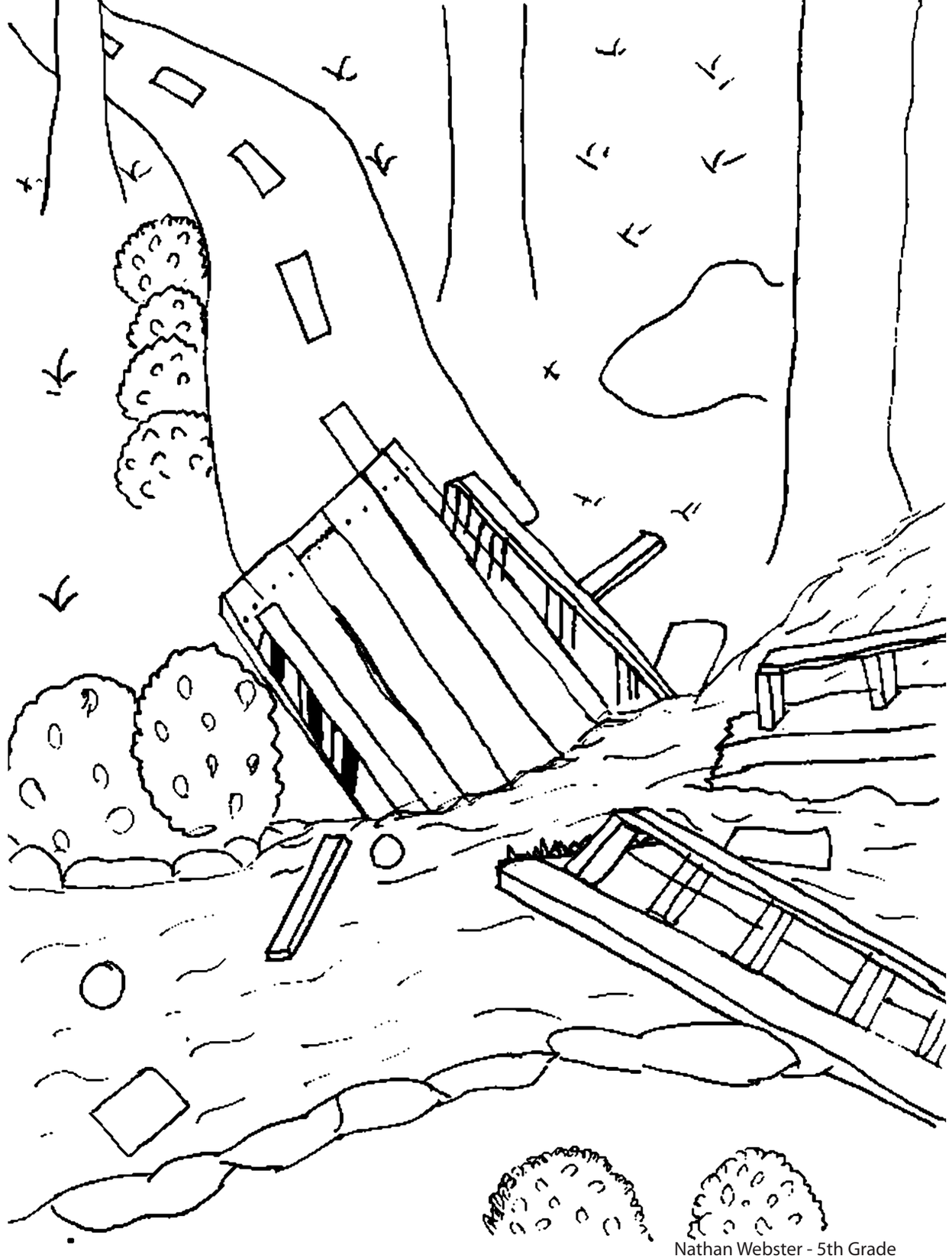
John looked up at his mother and asked, “But what happened to the bridge?”

Mom said, “Let's go over to the sink and I’ll explain what happened. When it rains, water falls to the ground and runs downhill. In the same way, water comes out of the faucet and runs down the drain. If there's a little water, then the drain can handle it, just like if there’s a little rain, the river can handle it and let it go downstream.” Mom turned both faucets fully open and said, “But if too much water comes out of the faucet, the drain fills up and water starts to rise in the sink. The same thing can happen with very heavy rain. The river fills up with water, it floods, and water goes over the bridge. If the water is forceful enough, the bridge breaks apart. This is very dangerous and no one can use the bridge until it’s fixed.”

Both children looked at each other, then at Mom, and hoped the bridge would be fixed soon. They continued to talk excitedly throughout breakfast about the storm, the rain, the flood, and the bridge.

Mary and John enjoyed the rest of the day with Mom. When Dad came home, he decided to treat them all to dinner at their favorite pizza parlor. The trip to the restaurant took much longer than usual because they couldn't use the bridge that had been washed out the night before. Dad and Mom talked about how many people were probably affected by the flood and the damaged bridge.

At school the next day, Mrs. Brady, Mary and John's teacher, told her class that a hydrologist would come in after lunch and talk to them about yesterday's flood.



Mary looked at John and whispered, “What's a hydrologist?”

“Probably somebody who rebuilds bridges once they've been washed out,” said John, feeling pretty sure of his answer.

After lunch the children returned to their classroom to find Mrs. Brady talking with a strange man. “It's the hydrologist!” thought the kids, as they sat down at their desks.

Mrs. Brady turned to her class and said, “Children, this is Mr. Anderson. He is a hydrologist with the National Weather Service.”

Mary thought, “Now I'm really confused. What does weather have to do with putting bridges back together?”

Mr. Anderson began, “You kids have had an exciting couple of days. I understand that you didn't even come to school yesterday because of the floods and the washed-out bridge. Well, all of these things may be confusing to you right now, but hopefully I can help you understand more about the weather and about hydrology. Let's start with a little game. We all like to play games, don't we?”

The children shouted, “Yeah, we like games!”

“OK, OK,” said Mr. Anderson. “We like to solve puzzles and play cards, don't we?”

Again, the children shouted with excitement.

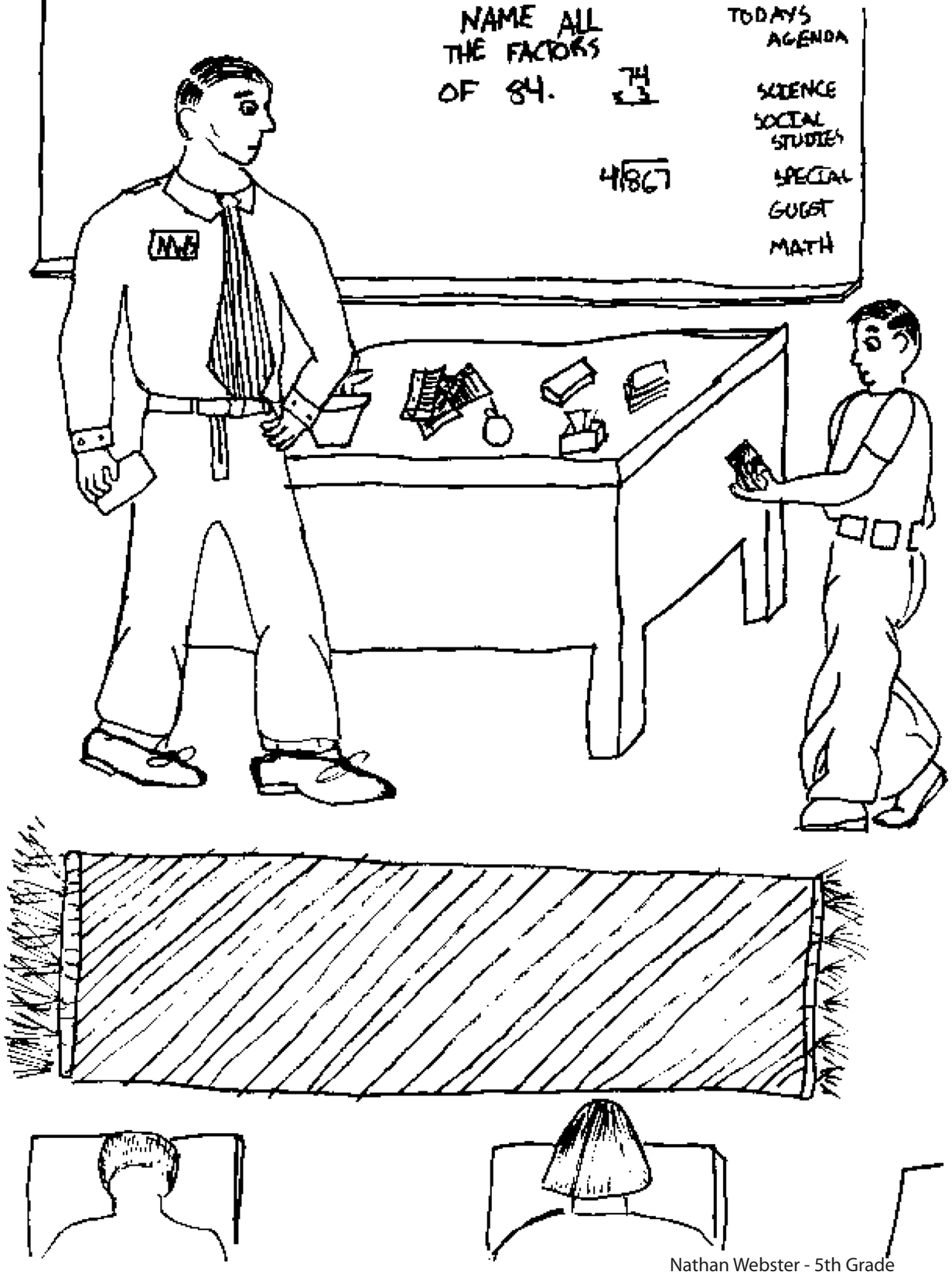
Mr. Anderson continued, “When we finish this game, you will better understand what I do as a hydrologist. Now, I have a stack of cards with different pictures on them. One of you will come up and pick a card and answer a question about that card. Once we have picked all of the cards, we will put them together to form a big picture and solve the puzzle of hydrology. Do I have a volunteer to pick the first card?”

All of the kids eagerly raised their hands. Everyone wanted to pick the first card. Mr. Anderson picked John to come up first. John turned over the first card, and there were pictures of a river, an ocean, and rain.

“OK, John, what do these three things have in common?” asked Mr. Anderson.

“Water,” John answered quickly and confidently.

“Very good,” said Mr. Anderson, as he patted John on the back. “These three things are made up of water. Now who wants to pick the next card?”



Nathan Webster - 5th Grade

Again, all of the kids raised their hands high into the air. Mr. Anderson picked Mary and she came up and picked the card with a picture of a cloud. “Now, Mary, does a cloud have water in it?” asked Mr. Anderson.

“Yes, it does,” Mary said very quickly. “That's where we get rain.”

“Very, very good,” said Mr. Anderson. “Now, who's next? How about you, the little girl with the pigtails?” Christy jumped up and picked the next card. This time it had a picture of the ground. “Does the ground have water in it?” asked Mr. Anderson.

Christy looked a little puzzled by this question and took her time with it. Suddenly she perked up, grinned, and said, “Yes, it does. I remember one time my uncle was drilling a new well on his farm. He dug a deep, skinny hole in the ground and put a pump in the bottom of it. Then he turned the pump on and water came pouring out. I was surprised to see how much water came out. He said that it was a very good well with lots of water.”

“I'm very proud of you, Christy.” Mr. Anderson said. “When it rains, water falls out of the clouds to the ground. The water seeps into the dirt and down into the ground. The water is now called 'groundwater,' and that is what Christy's uncle was pumping out of his well. Now kids, does water flow uphill or downhill?”

Everyone shouted almost at once, “Downhill!”

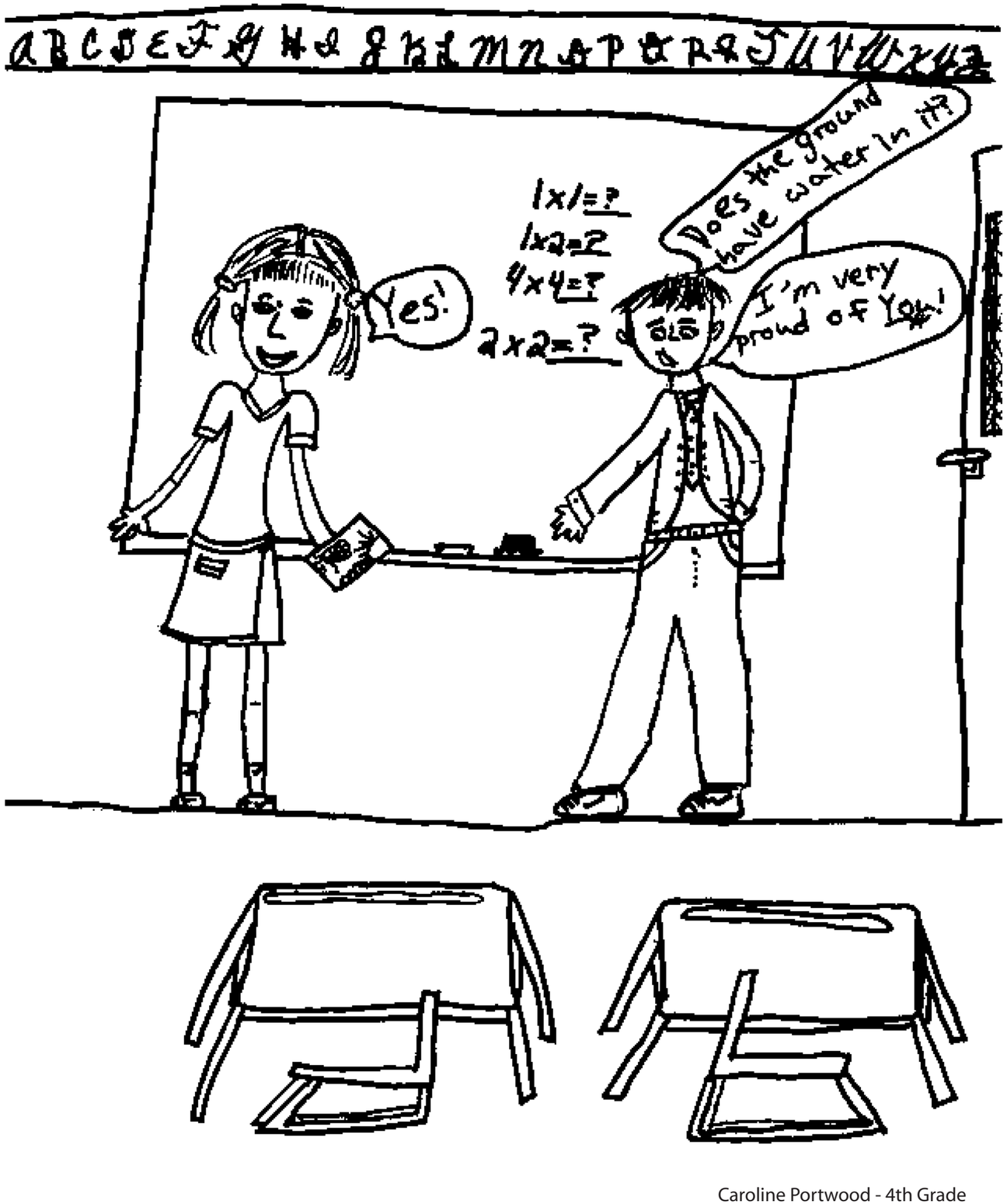
“That's right!” said Mr. Anderson with a big smile. “Water flows downhill to what lowest level?” That was a tough question, and all of the children had to think hard before they could raise their hands to answer.

Finally, Mark raised his hand and said, “Our basement, because every time it rains, water seeps through the walls and fills it up.”

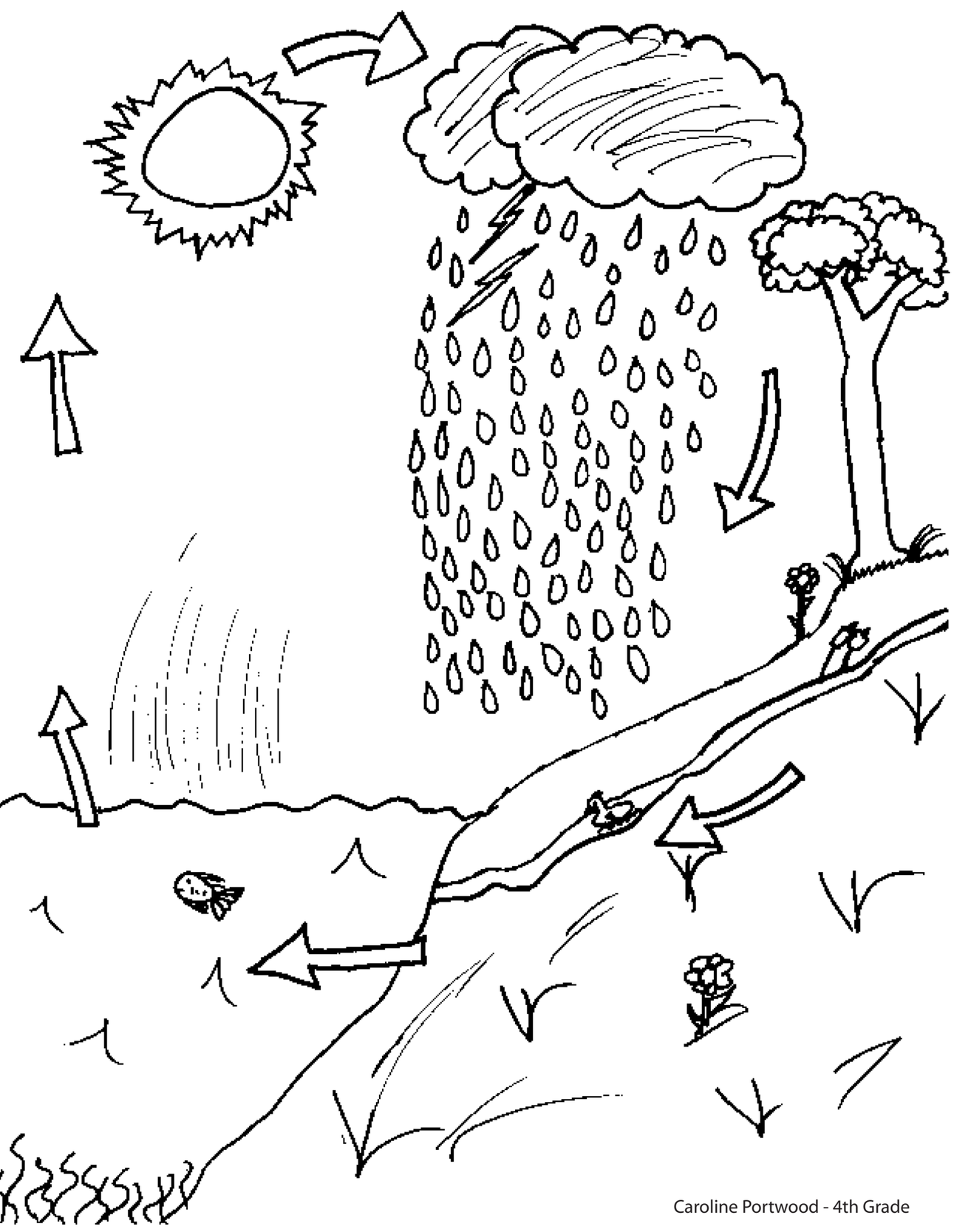
Mr. Anderson chuckled and said, “I'm sorry about your basement, but there is someplace lower than your basement where all of the water flows.” No one knew the answer, so Mr. Anderson said, “Have you kids heard about sea level? That's the level where the oceans touch the land. Water flows downhill until it gets to the ocean. OK, I know that was a hard question. We have only one more card to turn over before we have all of the pieces to our puzzle. Who wants to come pick this card?” Since the last question was really difficult, no one moved until Tony slowly raised his hand about half way. Mr. Anderson called him up and he picked the last card. It had a picture of the sun on it. Mr. Anderson asked him, “Tony, does the sun have any water on it?”

Everyone in the class laughed at this silly question, and Tony answered hesitantly, “No?”

“Very good answer! You thought I was trying to trick you, didn't you?”



Caroline Portwood - 4th Grade



Caroline Portwood - 4th Grade

"Yes, sir," said Tony, now laughing with the rest of his friends. Then he asked, "But if all of these other cards have water in them, where does this card fit in the puzzle?"

Mr. Anderson patted Tony on the back and said, "That's a very good question, and I will answer it by showing you how this puzzle fits together." The classroom got very quiet as Mr. Anderson bent down and picked up a big board from the floor beside him. He put the board on the table in front of everyone, and on it he placed each of the cards where it belonged. "These are all of the pieces of the puzzle put together. Who can tell me what you see in this puzzle?" asked Mr. Anderson.

Sandy raised her hand and very quickly said, "A circle!"

"That is correct!" Mr. Anderson exclaimed. "This circle is called the hydrologic cycle or water cycle. If you want to remember it easily, think of it as the game of water movement. This game takes us on a trip from the beginning of the circle to the end, where we started. Let's start the trip, OK? The sun heats the water in the ocean. This water evaporates and rises into the air because warm air rises. As it's rising, it cools and turns back into water droplets. This process is called condensation. These new water droplets join together to form a cloud. As the heat from the sun evaporates more water from the ocean, the water rises and forms thicker and heavier clouds. The wind blows these clouds over the land, and when they get so full that they just can't carry any more water, the clouds release the water. The water falls out of the clouds and onto the ground as rain. Who knows what the water becomes during very cold weather?"

"SNOW!" they all shouted, and Mr. Anderson had to laugh at their enthusiasm.

"It looks like you kids like it when it snows. OK, the water is now on the ground and begins to soak into the dirt. This water now has become groundwater and begins to flow downhill. It finds its way into the nearest creek or stream. The water travels down the creek or stream and then flows into a river, which then flows downstream into the ocean. Now the water is back in the ocean where it started, and is ready to be evaporated again by the sun. This starts the game of water movement all over again. This is the hydrologic cycle or water cycle, and is what hydrologists are most interested in--the movement of water on the earth."

Mr. Anderson reached down again and picked up a large box, setting it on the table in front of the children. Mrs. Brady walked over and helped Mr. Anderson take all kinds of interesting things out of the box and fit them together on the table. In front of their eyes, the children saw a toy village very quickly taking shape. They became more excited as this village grew and grew, and as more interesting pieces came out of the big box. All of the children gathered around the table as Mr. Anderson and Mrs. Brady put the finishing touches on the village. There were hills, houses, and a little factory in this village. There were little toy people and animals, and in the middle, traveling through the whole village, was a little river with real, running water. There was a bridge across the river in the center of town, and Melissa said excitedly, "There's a river and a bridge in the middle of our city just like in this toy village!"

All of the kids nodded their heads yes, they remembered.

"Well," Mr. Anderson continued, "let's pretend that it has been raining on our little village and the water is flowing down these little hills toward the river." With that, Mr. Anderson let more water flow through the little river. "Now, what if this town gets a really big storm and more rain falls?" Mr. Anderson let even more water through the river. The children squealed as they watched the water spill out of the river and splash into the town's houses and into the factory and begin to completely cover the little bridge.

"Stop, or you're going to hurt it!" shouted Mary, as everything in the little village was getting soaked.

"That's exactly what I wanted you kids to see today," Mr. Anderson said. "This is what we call a flood. This is what happened the other day that washed out our bridge and kept you out of school."

"So that's what being washed out really means," John said, as he remembered looking at the real bridge that was underwater yesterday.

"That's right," Mr. Anderson continued. "You can see how important it is for the people in this little village to know when the river will rise so they can get out of the way of the flood." He picked up the wet people, animals, and cars from the village and wiped them with a towel. All of the kids laughed as Mr. Anderson kept picking up toy people and wiping the water off of them. Mr. Anderson looked at all of the kids carefully and said, "This is fun with toy people and animals, but if this was a real river and these were real people, this flood would have been very dangerous and these people and animals could have died. It is a very important part of the hydrologist's job to warn people of floods just like this one so they can protect themselves and their homes."

"Thank you very much for inviting me here today, Mrs. Brady. You have a classroom full of very smart and fun students," Mr. Anderson said.

Kathy had been quiet the whole time and listened very carefully to Mr. Anderson, and now she raised her hand.

Mrs. Brady said, "Yes, Kathy, do you have something to say?"

Mary Chaudoin - 3rd Grade

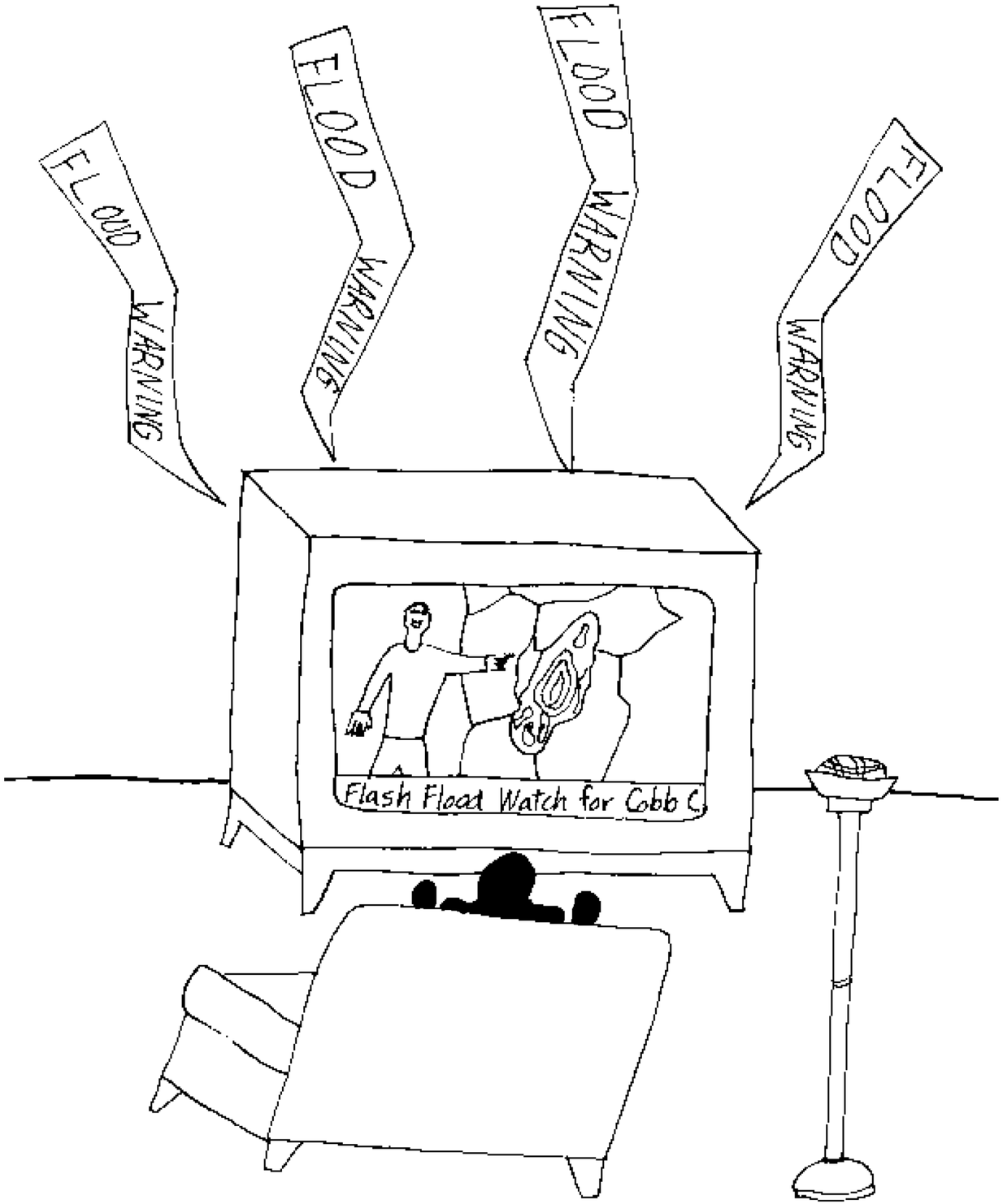
Mary Chaudoin - 3rd Grade

"Yes, ma'am," she started. "I am very happy that Mr. Anderson came and talked to us today. I learned a lot about rivers and floods and hydrologists. I live right beside the river and we play near the water all of the time. I am glad that hydrologists can tell us when we need to get away from the river so a flood can't hurt us."

"That's very good, Kathy. Thank you very much, Mr. Anderson," said Mrs. Brady, as all of the kids clapped and cheered.

When Mary and John went home from school that day, all they could talk about was the river and how exciting it was to meet a real hydrologist. Their mom and dad listened all evening about all of the new things they had learned about the river, water, and floods. Mom tucked them in bed that night and kissed them goodnight as they drifted off to sleep--safe, warm, and protected.

Mary Chaudoin - 3rd Grade



Ryan Sanders - 4th Grade

The Safety Rules

OK, kids, now that you have a much better idea of how hydrology works, you need to know exactly what to do during a flood or flash flood. Talk to your parents and teachers about these safety rules and get as much information as possible from them about what happens to your home, neighborhood, and community during a flood. Most kids who are hurt in floods have been playing alone or with other kids in very dangerous locations. You need to know where these dangerous locations are and what you should do in case there are no parents or other adults around to help you.

Remember, during any flood or other weather emergency, stay tuned to NOAA Weather Radio, commercial radio, or local television. Information from these sources may save your life.

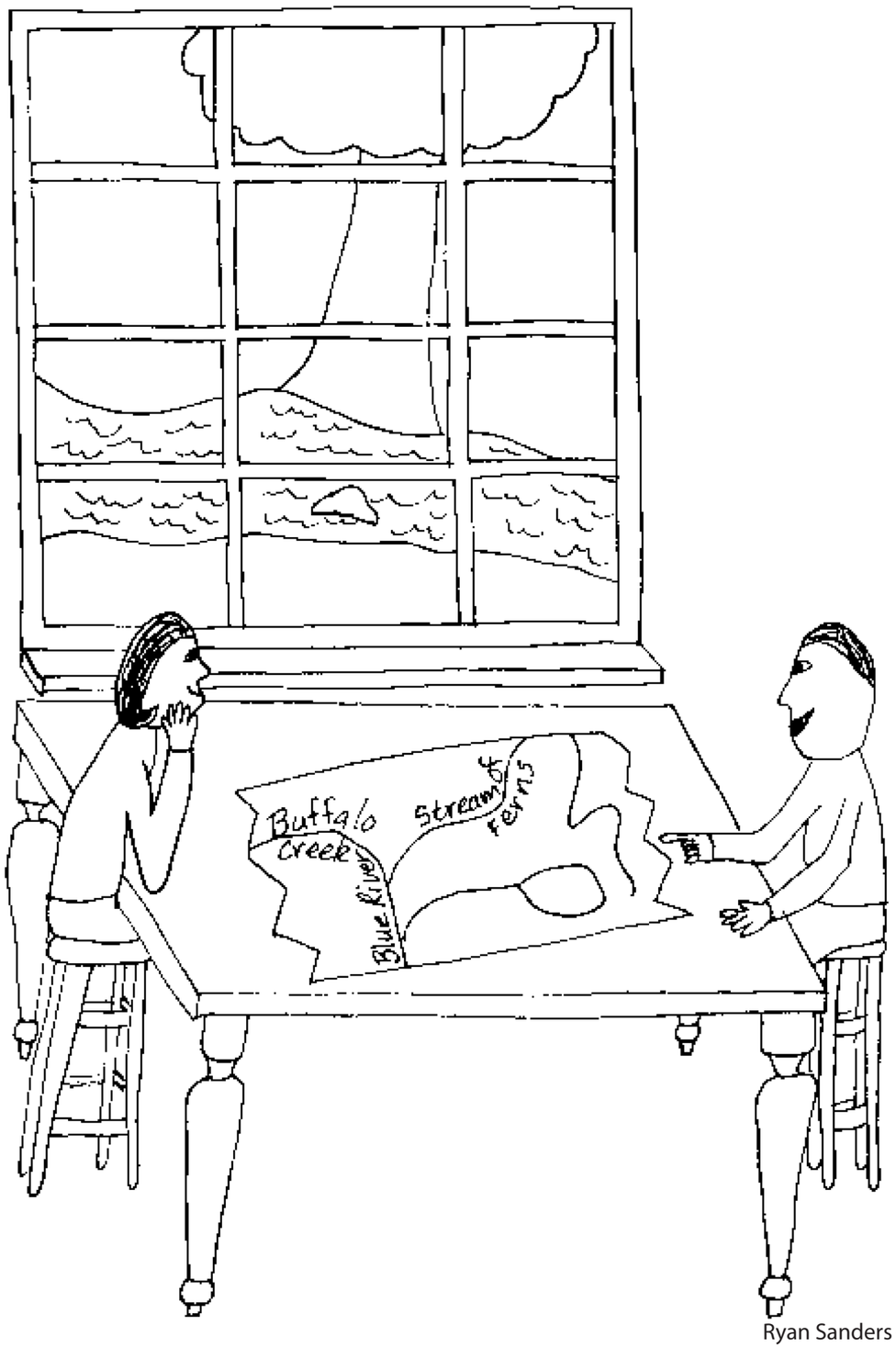
The National Weather Service issues **flash flood watches, flash flood warnings, and flood warnings**. A **flash flood watch** means that a flash flood is possible; watch out! Stay alert, be smart, and be prepared. Watch out for heavy storms and get ready to act if a flash flood occurs. A **flash flood warning** means that a flash flood is happening or going to happen soon. Stay away from rivers and streams and any other place where water can overflow and cause flooding problems. Examples of these other places are ditches and culverts, city streets near storm drains, irrigation and drainage ditches, and any other waterway near where you live or play. A flash flood can happen very quickly and, in most cases, will go away just as quickly. A **flood warning** is mostly for larger rivers and streams where the water reacts more slowly and the flooding lasts over a longer period of time.

During a flood emergency, don't panic! That only causes more problems. Move to higher ground immediately if you are in the path of the flood. If you are outdoors, leave everything and run! A flash flood can pick up cars, campers, vans, and recreational vehicles and roll them. It can move huge boulders, uproot trees and carry them downstream, wash out roads, and tumble bridges like little toys.

Here's what you can do *before the flood*:

- Ask your parents if your house is in a flood plain. If it is, find out where the nearest creek, stream, or river is to your home and where you play.

- Assemble a disaster supplies kit with your family. This kit should contain a first aid kit, canned food and a can opener, bottled water, rubber boots, rubber gloves, a battery-powered radio, a NOAA Weather Radio, a flashlight, and extra batteries.



Ryan Sanders - 4th Grade

Find out where the nearest creek, stream, or river is to your home and where you play.

Ryan Sanders - 4th Grade

Assemble a disaster supplies kit with your family.

- Store drinking water in clean bathtubs and in various containers. Water service may be interrupted.

Here's what you should do *during the flood*:

- Avoid those areas that are already flooded. If you come upon a flowing stream, ***do not*** walk through the water if it is above your ankles. Turn around and go another way. The water could knock you down and the current could sweep you downstream.

- If you are in a car with your parents or other adults, ask them to ***please not drive*** over a flooded road, since no one knows for sure how deep the water is. The road may be washed out under the water. You do not want to be stranded in your car in a flood. Cars can be lifted off the ground and carried away in as little as two feet of water. Be especially careful at night when it's more difficult to recognize the dangers.

- ***Never, never, never*** play around flood waters. You could easily slip and fall into the water and be swept downstream. You could also get trapped by rapidly rising water and be in danger before you could even react.

Here's what you should do *after the flood*:

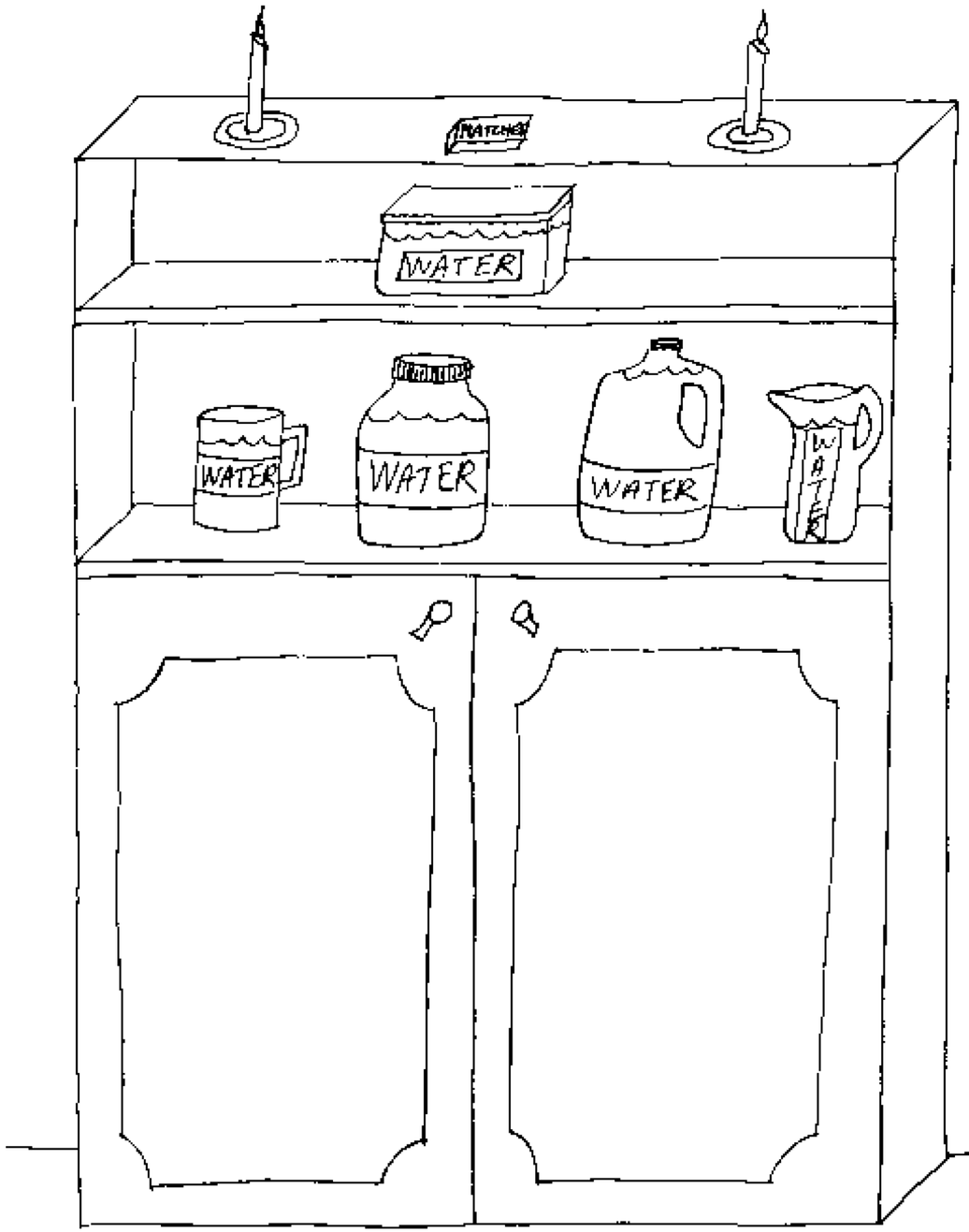
- Do not visit disaster areas. You may be in the way of rescue or emergency professionals who are trying to help people.

- Boil water from the faucet before using it for drinking or cooking.

- Remember that the Red Cross provides first aid, food, clothing, and shelter in case the flood has damaged your home.

- Do not use any electrical equipment if it is wet. Have your parents or another adult check all of the electrical appliances, including your televisions, radios, or clocks if they got wet. This is a good rule anytime anything electrical gets wet.

Remember, kids, it is very important that you be smart and know what to do in severe weather emergencies. These include thunderstorms, tornadoes, hurricanes, high winds, hail, and heavy snow and blizzards, as well as floods and flash floods. Have an emergency action plan ready and help your family survive these severe weather events. While you're making action plans, don't forget a fire safety plan and an earthquake safety plan for your home. Having these plans and knowing what to do could mean the difference between life and death to you or to someone you love.



Ryan Sanders - 4th Grade

Store drinking water in clean bathtubs and in various containers.

Natasha Lee - 5th Grade

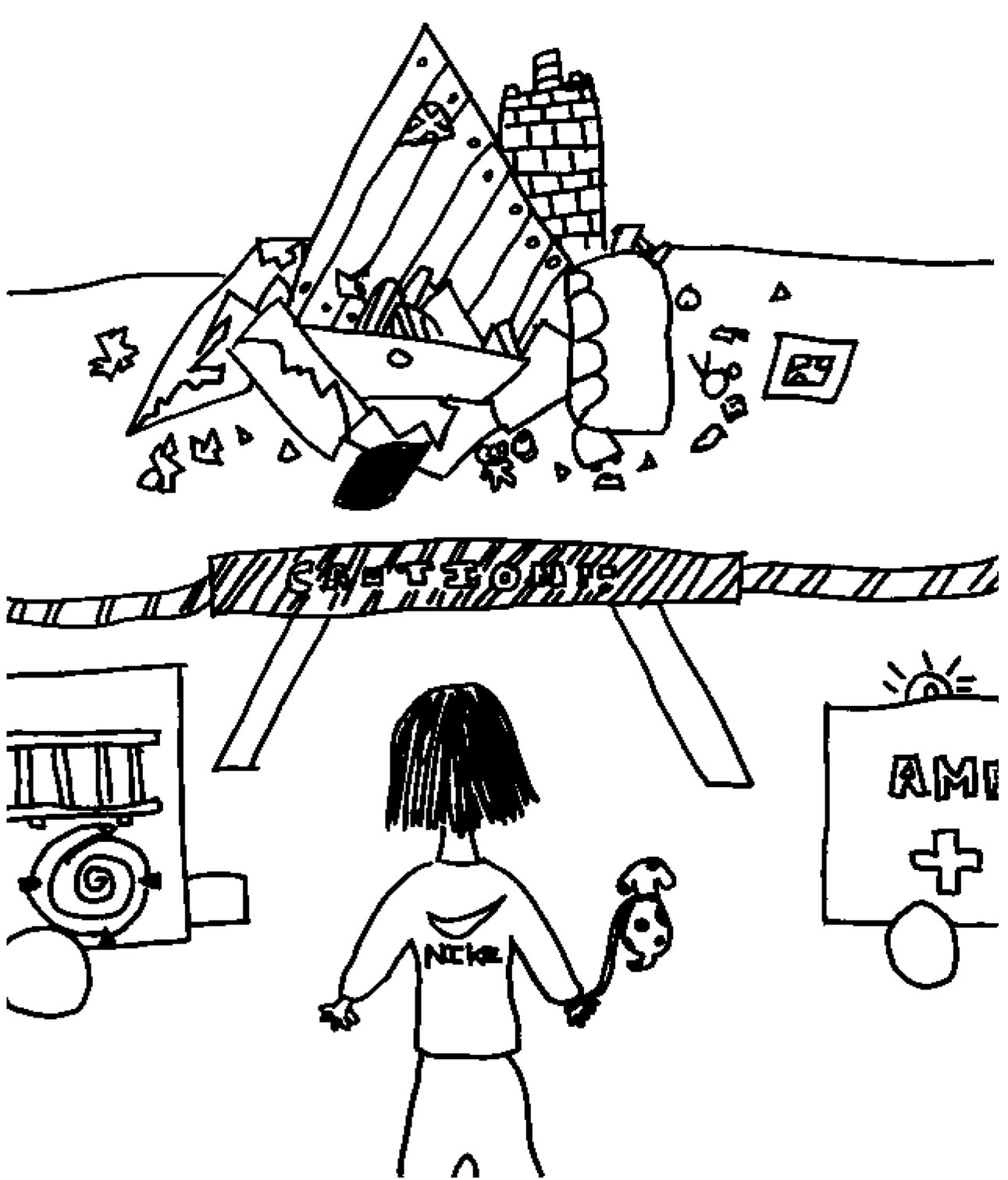
Avoid those areas that are already flooded. Do not walk through the water if it is above your ankles.

Natasha Lee - 5th Grade

Do not let anyone drive over a flooded road, since no one knows for sure how deep the water is.

Natasha Lee - 5th Grade

Never, never, never play around flood waters.



Natasha Lee - 5th Grade

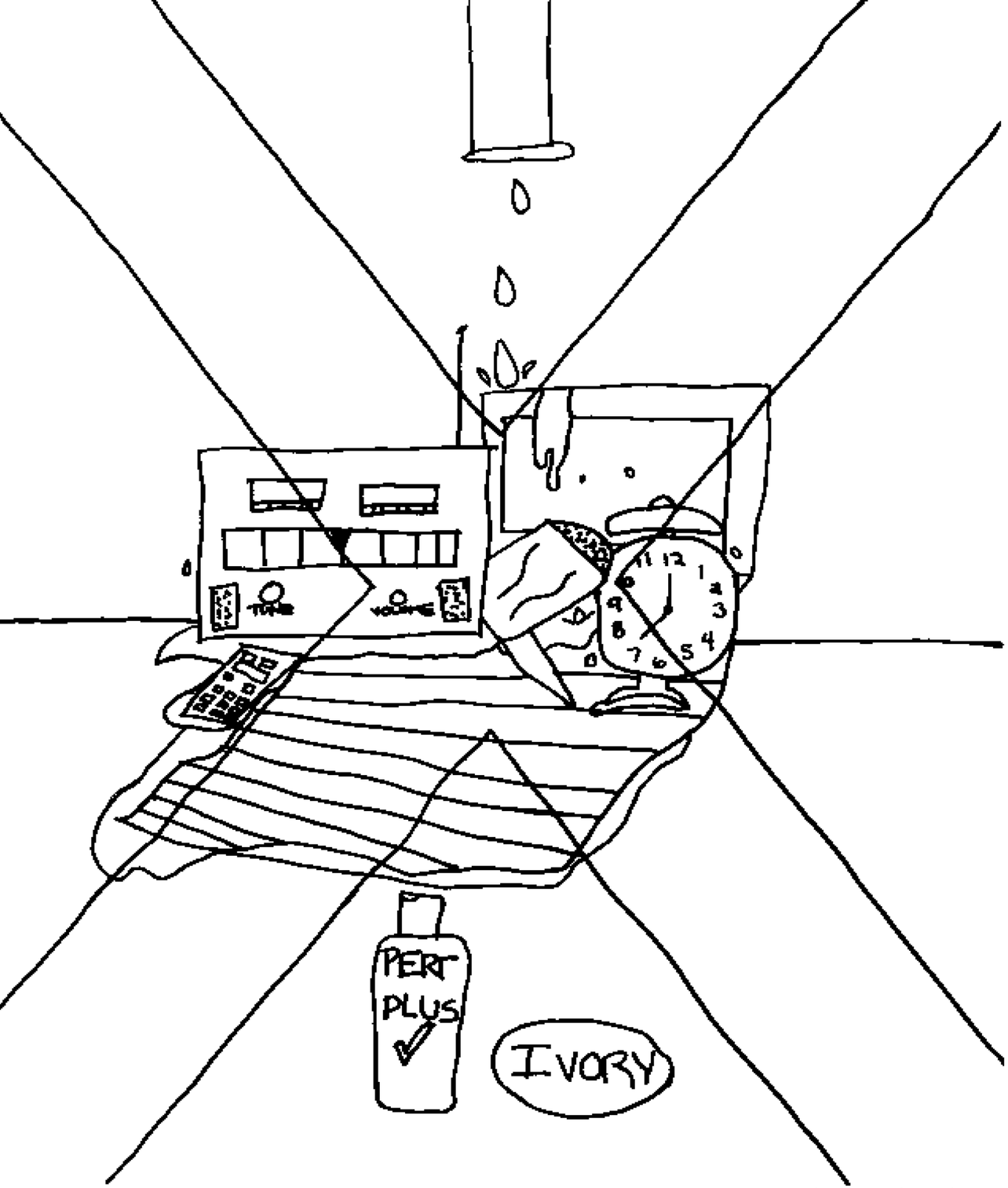
You may be in the way of rescue or emergency workers if you visit disaster areas.

Natasha Lee - 5th Grade

Boil water from the faucet before using it for drinking or cooking.

Natasha Lee - 5th Grade

Remember the Red Cross provides help in case the flood has damaged your home.



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