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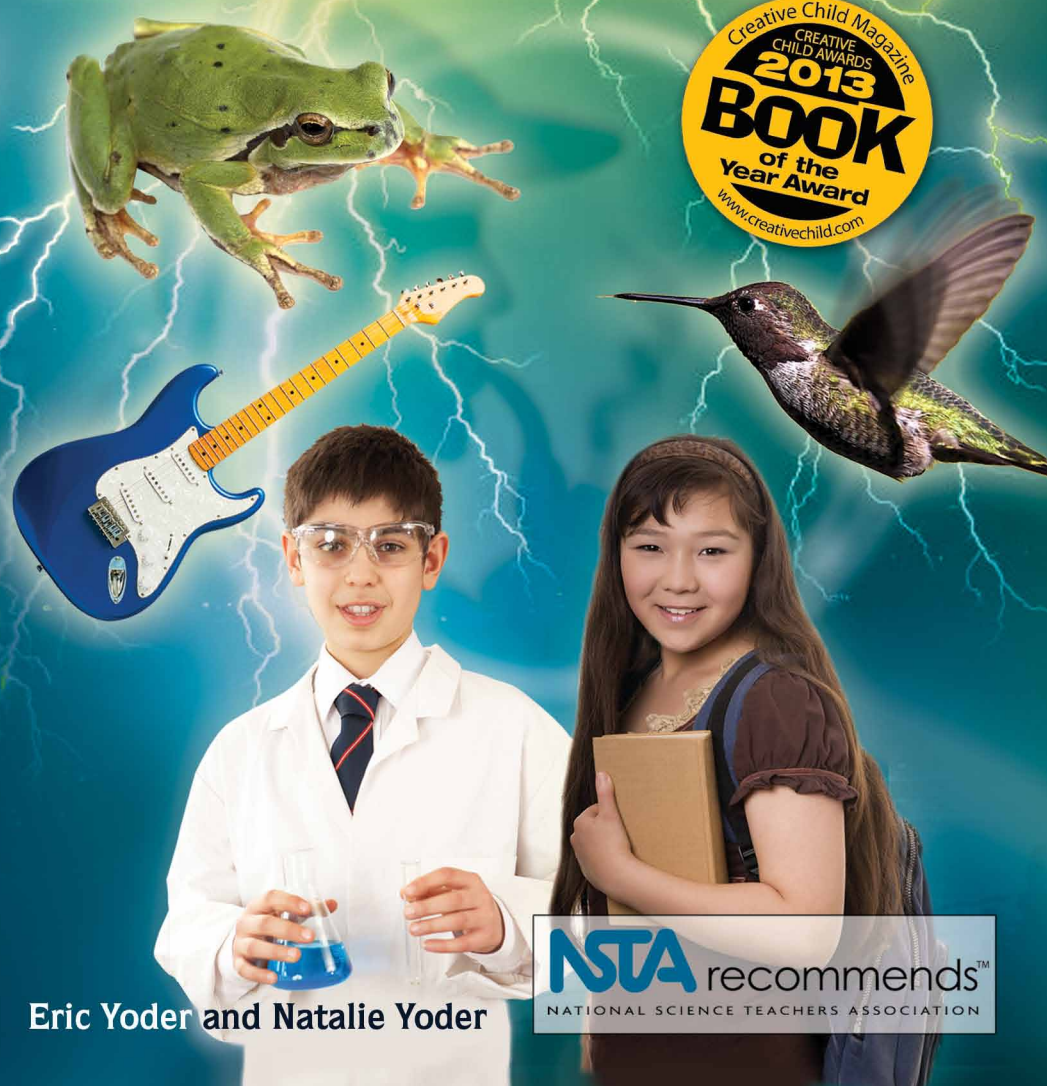

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Why? This book helps kids answer that important question. Filled with kid-centric mini-mysteries and clear and concise solutions, these mysteries encourage kids to think critically about real-life situations. With Next Generation Science Standards on the horizon, this book will be a sure hit in the classroom. An entertaining and educationally-engaging tool for science teachers everywhere!

—Gail O. Schulte, Recipient of the Presidential Award for Excellence in Science Teaching, Instructional Facilitator, Rutherford County Schools, TN

Learning how to sort the relevant from the irrelevant in an information-rich environment is how students become critical thinkers. This book is a refreshing gateway into scientific investigation. Just the ticket for families to enjoy together or for keeping the kids stimulated on a long car trip or a rainy afternoon!

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I have been using One Minute Mysteries as BRAIN activities with my 6th grade science class. It has been such a hit! The students love them because they are challenging and encourage them to apply their science knowledge to real world problems. The kids compete enthusiastically to solve each mystery, which stimulates wonderful scientific debate. I love them because each mystery kick-starts their brains into a critical thinking, problem solving mode in just minutes at the beginning of each class.

—Margie Hawkins, 6th grade Science Teacher, Winfree Bryant MS, Lebanon, TN
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—Ryan McAllister, Ph.D., Examiner.com

Wow, I love these! These fabulous little mysteries encourage curiosity, develop critical thinking, promote creativity and, shhh…even allow kids to learn something! The Yoders have really come up with a family-friendly treasure!

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Table of Contents

Why I Wrote This Book–
by Eric Yoder

When Natalie and I set out to write this book, the third in our "One Minute Mysteries" series, it was a different process. Our first two books had strong sales and we had to make sure that this next book did not repeat the themes in either the first science or math book. Also, Natalie was a middle school student and budding writer for the first book, a high school student for the second, and now she is in college, much more adept at writing. Continuing to write together has helped shape and grow our relationship.

As with the first book, I wanted to emphasize the widespread, real-life applications of science. Fortunately, the topic of science is virtually endless, especially from a young reader's perspective, so we had a lot of material to work with. So much of what happens in the world around us reveals its underlying science...if we just take the time to think about it. And once you think, you're more likely to explore. All of us could stand to do more of both!

Creating these books brings us a lot of pleasure. We hope you'll enjoy the journey through these stories and that they will inspire you to make discovery a part of your daily life.

–Eric

Why I Wrote This Book–
by Natalie Yoder

Writing these books was a great experience as a middle school and high school student. It definitely expanded my writing skills and helped prepare me for college. Through this writing process, I learned how to put a story with a twist into a small number of words and to create characters and settings.

Writing each book has been a different experience. I especially enjoyed writing this book because, after years of creating mysteries, we'd already stashed away a bunch of story ideas, and when we got stuck we still had fun bouncing ideas off of each other. We've become more efficient at writing and editing the stories. We've become good at understanding how a story has to flow and we can easily pick out which ideas aren't going to make it. I grew up learning that practice makes perfect, and now I know that is especially true of writing!

Creating these books has been a highlight of my life. It makes me happy that kids love them. Writing is a great skill and it lets you communicate with the world. At any age, you can write if you set your mind to it. It doesn't matter what you write about, just write.

–Natalie

Life Science

1 Cool as a Cucumber

When Alex and Iona planted a vegetable garden the previous year, their dog, Trevor, discovered how much he liked to jump over the barrier and destroy the plants. Cucumbers were Trevor's favorite. He would get at the cucumbers just as they were starting to ripen. Pulling the young cucumbers off their vines, he would stretch out in the sunshine of the yard and eat them.

Now it was time to plant this year's garden, so Alex and Iona went with their father to the hardware store to pick up seeds and fertilizer.

"I have an idea," Alex said, disappearing down a hardware aisle. He came back with some wooden stakes and a roll of the fine wire mesh used for window screens.

"What do you plan to do with those things?" their father asked.

"I'm going to build a cage to protect the cucumber plants," Alex said. "I'll make it strong and have the plants totally covered, all the way around from the ground and across the top. Then there will be no way Trevor can get at the cucumbers."

"I'm afraid if you do that, we still won't have cucumbers on our salads this year," Iona said.

"The plants will still get water and sunshine. That's all they need to grow, isn't it?" Alex wondered.

"That's all the plants need, sure. But to grow cucumbers, they also need something else."

"What could that be?"

"The plants would start to grow," Iona said. "But for the plants to produce cucumbers, they first put out flowers. Those flowers need to be pollinated, and insects do that. If there is no way for the insects to get to the flowers to pollinate them, the cucumbers won't grow. Let's get a kind of wire mesh that has holes big enough to let insects in, but that will still keep Trevor out."

2 Whale of a Time

"I'm so happy that we decided to take this whale-watching tour!" Matt managed to yell to his parents over the sound of the engine as the boat moved rapidly through the waters of the Atlantic Ocean.

They had agreed to take him on the tour after he had been studying biology the whole year. He had a passion for learning about marine animals and wanted to see them in the wild. His little sister Abigail had come along, too.

The boat slowed down and the engine finally stopped. The captain came out on the deck and joined them.

"We're in their migration route. Keep watching," he said, and went back to the controls.

After a long time had passed, Matt started worrying that they would never see any whales. The captain had said there was no guarantee. However, he suddenly called the passengers to join him in the control room.

"Look at this," he said, pointing to a screen with large dots on it. "This is sonar, which uses sound to detect anything in the water. There are whales headed our way."

Abigail said, "But fish can just stay under the water. Maybe they'll never come up and we won't see them."

"Let's go out on the deck to watch. They'll come up," Matt said.

"What makes you so sure?" she asked.

"Whales aren't fish," Matt said. "They're mammals, and they breathe air. They can hold their breath for a long time, but eventually they have to come to the surface for fresh air. When they take a breath they first blow out the old air, sending some water up with it. That's what we can look for. Fish, on the other hand, get their oxygen from the water through gills, so they don't need to come up for air."

3 Back to Nature

Hayden and Audrey's family had moved during the summer when their mother started working in a rural health clinic. Now, several months into the school year, they had gotten to know many of the families on the farms around them. Most of them did not live within walking distance so they had to ride their bikes to visit them.

Their four friends who lived within biking distance all had farms on which they grew trees. Wyatt's family had apple and peach trees. Henry's family grew oak trees for landscaping and Malcolm's family specialized in decorative maple trees. Carson's family, who lived the farthest away, had acres of Christmas trees around his house.

Audrey was watering flowers in the front yard when Hayden pulled up the driveway on his bike.

"I thought you'd be back a while ago," she said. "What were you doing?"

"Mainly watching animals at a friend's place. Birds, rabbits, a bunch of squirrels gathering acorns..." he said. "Living here is really different than living in the city. I'm really starting to get into all this nature stuff."

"I am, too! In fact, I bet I know whose house you were at simply based on what you said," she said.

"No way. I bet you don't!" he retorted.

"You're on! Loser does the dishes tonight."

"Okay, but you only get one guess. Where was I?" he asked.

"You were at Henry's house," Audrey said. "Maple trees, Christmas trees and fruit trees don't produce acorns, but oak trees do. Squirrels are very active at this time of year, gathering and storing them for the winter. Am I right, or am I right?"

"Fine, you're right. I guess I'll do the dishes tonight," Hayden conceded.

4 The Root of the Situation

"Daisuke, don't forget to water my plant while I'm gone!" his sister Miyu reminded him as she left the house.

Daisuke had agreed to take care of Miyu's plant during the weeks that she would be away on a concert tour with her high school chorus. She kept the plant inside their screened-in porch, where it got sunlight, but not rain. She had told her little brother it needed to be watered regularly in the hot summer weather.

Daisuke got a spray bottle and sprayed the leaves every day. After a few days, he wanted to prove to his sister that he had been taking care of her plant, so he asked his mother to send her a picture of the plant with the sprayer he used next to it.

That night when Miyu called she asked to talk to Daisuke.

"That plant looks droopy," Miyu said. "Are you sure you're taking care of it?"

"I water it every day," Daisuke said defensively.

"Dad, could you help Daisuke with the plant?" Miyu asked when their father took the phone from Daisuke.

"I haven't been watching him," their father said. "What do you think he is doing wrong?"

"I don't think he's giving it enough water," Miyu said.

Their father went out on the porch with Daisuke and checked the soil. It was almost completely dry.

"You're right," their father said before he handed the phone back to Daisuke and went to the kitchen to get more water for the plant.

"What did I do wrong?" Daisuke asked Miyu on the phone.

"Daisuke," Miyu said, "plants need water, nutrients and sunlight to grow. They get sunlight through their leaves, but most of the water and nutrients they need come through their roots. Some plants can absorb enough water to survive through their leaves, but most plants need to be watered at the roots. So when I saw the spray bottle but no other water container, I knew what was wrong. If you were misting it every day and it still needed water, you must have been only spraying the leaves, and not putting water at the roots where it could be more easily absorbed."

Earth and Space Science

16 It's All Alien to Me

Miss Vaughn divided her creative arts class into groups of four. Each student was to draw a scene of what one part of life might be like on another planet. Later, they would put them on poster board.

Kathleen's assignment was to show life inside an alien home. She drew the inside of the house with strange-looking gadgets and little green pets everywhere.

Joaquin's part was to show aliens at work. He drew a factory where robots were doing all the actual work and the aliens were just pushing buttons.

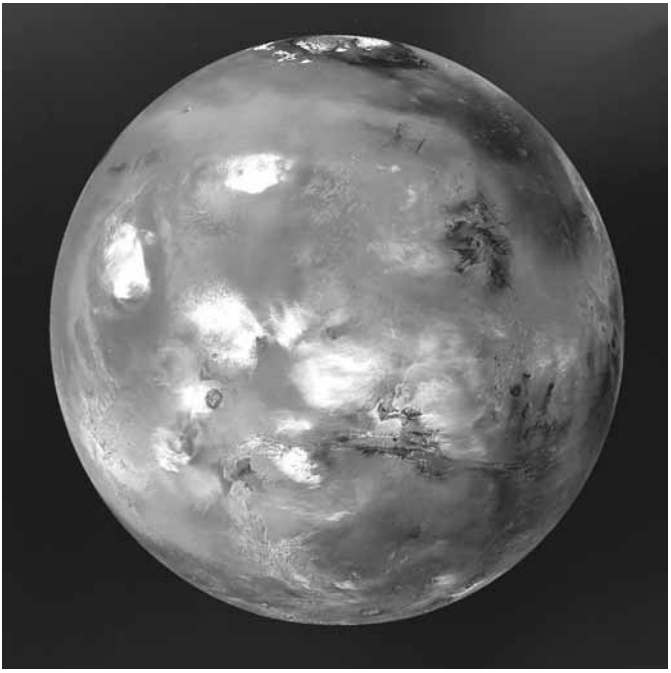
Albert's drawing showed aliens in school, wearing helmets that piped facts into their heads.

Valerie's part was to show recreation. She loved ice hockey, so her drawing had aliens wearing orange jerseys playing ice hockey on a pond.

"Now we just have to decide which planet this should be," Joaquin said as they arranged their pieces.

Miss Vaughn came to their group of desks and looked at the drawings. She said, "All the planets are taken except for Venus and Mars. Label yours with the one that fits all of your drawings better out of those two."

"What difference does it make which planet we choose?" Kathleen asked after Miss Vaughn left.



Albert said, “The inside scenes of home, work and school could fit on either planet since you control the environment inside a building. But we have to choose the planet with the outdoor environment that matches Valerie’s pond scene.”

“We can’t pick Venus because it’s so close to the Sun that it’s too hot for ice,” Valerie said. “But there is ice on Mars in its polar ice caps. So let’s say this is life on Mars.”

17 Where in the World?

As much as Leila missed having Chloe around for their summer vacation, she had to admit that Chloe must be having a great time traveling.

Chloe's father was working on a trade treaty between the United States and other countries bordering the Pacific Ocean. Since he would be traveling for weeks, he was allowed to take his family as long as he paid for them. Chloe and her mother would sightsee while her father worked. Every day Leila checked for a new e-mail from Chloe describing her adventures.

Chloe had given Leila the list of countries her family was visiting and so far they had been to four—with Japan, China and New Zealand still to go. But Chloe hadn't told Leila in what order they were visiting the countries. Instead, each time Chloe arrived in a new country she took pictures, attached them to an e-mail, and challenged Leila to figure out where she was.

This day's e-mail didn't have a picture, just a message: "We flew to a new country yesterday, but it got dark so early I couldn't take any pictures outside. I'll take some today and send them for you to guess what country it is."

Leila wrote back, "Send the pictures, but I already know where you are."

Later, a message came back from Chloe: "How do you know?"

"You must be in New Zealand," Leila wrote back. "That's the only country in the Southern Hemisphere out of the three still on the list. It's summer here in the Northern Hemisphere and the days stay light a long time, but it's winter there, meaning the Sun is up for a shorter time. It's due to the tilt of the Earth's axis, which causes light to shine longer on one hemisphere or the other at different times of the year as the Earth orbits the Sun. If it got dark early at this time of year where you are, you couldn't be in China or Japan, which are in the Northern Hemisphere."

18 Up in the Air

"I'm surprised at how hot it is here," Rylee and Aiden's father said as they settled onto a shaded picnic table.

They were on a trip through the Western mountain states and had just arrived that morning in Yellowstone National Park. They were having lunch while waiting for the next eruption of Old Faithful, which a ranger said was going to be in about half an hour.

"I'm afraid our hotel doesn't have a swimming pool," their mother said as she put water bottles on napkins that were about to blow away.

"Maybe we could take a walk in the woods later on," Rylee said. "It should be cooler in the trees."

Aiden was studying a map. "Look at this, there's a trail from here that goes past a lot of geysers. Not right next to them, but close."

"So?" Rylee said.

"So, we just follow that trail and we'll cool down," he said.

"But the trail is in the direct sunlight," she said, looking at the map.

"Aren't you forgetting the wind is blowing?" he asked.

"Aren't you forgetting something else?" she challenged.

"I'll bet you're thinking that because the path is so close to the geysers, the wind will blow a spray of water on us," Rylee said.

"Right," he said. "That will cool us down."

"But the water from a geyser is hot," she said. "The water under the ground gets heated to boiling by hot rocks. When the steam builds up enough pressure, it shoots out through a passageway to the surface. That's what makes a geyser. The last thing we want on a hot day is to be sprayed with hot water."

19 A Good Look

"I can always use extra credit," Noah said to himself as his teacher Mr. O'Shea handed out a list of projects the students could do to improve their grades.

One of them gave a date and said: "Directly observe the eclipse and write a short description of the event and its cause."

Later Noah was discussing it with his friends Omar and Marcos.

"How does he know there's going to be an eclipse on that day?" Marcos asked.

"I think the places and dates where eclipses can be seen are figured out a long time before they happen," Omar said. "In fact, I think the exact times are even figured out."

Noah looked at the sheet. "It doesn't say what time, just the date," he said. "Maybe I won't be able to do this after all."

"I'm sure that you'll find out closer to the date," Marcos said. "What's the difference?"

"For a solar eclipse, I'd have to make sure I'm not doing anything else at that time of the day," Noah said. "If it's during a school day, maybe I won't get excused from class."

"I don't think that's going to be a problem," Omar said.

"Why not?" Noah asked.

"It must be a lunar eclipse, not a solar eclipse," Omar said. "I'm sure Mr. O'Shea would never tell anyone to look directly at a solar eclipse. A solar eclipse happens when the Moon blocks out the Sun, but light from the Sun still shines around the edges and it will damage your eyes. In a lunar eclipse, the Earth comes between the Sun and the Moon, and the Earth's shadow falls over the Moon, turning it darker. A lunar eclipse is safe to look at, but a solar eclipse isn't. And lunar eclipses only happen at night, so you don't have to worry about getting out of class to see it."

Physical and Chemical Science

31 A Half-Baked Idea

"Save room for more!" Evelyn told her family during dinner. "I am making cookies for dessert!"

Evelyn's family was vacationing at the beach, far from their home high in the mountains. She loved to bake, and she always used the same recipes, so she had them memorized. She decided that she wanted to bake a treat for her family while they were all together on vacation.

She had gone grocery shopping earlier that day with her mother to get the supplies she needed, so after dinner all she had to do was mix the ingredients and bake them like always.

When she took the cookies out of the oven, she was appalled by what she saw. The cookies had all run together and still had not risen like they were supposed to. They looked really gross: half-burnt and half-baked.

When her older brother George walked by and saw them, he didn't make her feel any better, scrunching his nose and giving them a thumbs-down.

"Ew. What is wrong with your cookies? Did you put too much butter in them or something?" he asked.

"No! I did everything exactly the same as I normally do."

"Then that must be the problem," he said.

"What do you mean?"

"The recipe you used to make the cookies was one designed for high elevations," George said, "but when you tried to make your cookies the same way down here at sea level, it didn't work quite right. You are used to baking where the elevation is higher and the air pressure is lower. At high elevations, water evaporates more easily and the leavening agents that make the dough rise, like baking powder and baking soda, work more effectively. Here, there is more air pressure to keep water from evaporating and gas from rising as easily, which is why your cookies came out so runny. The ingredients, temperature, and time that you cook them all need to be adjusted. Why don't we look up a recipe for making these cookies at sea level and make a fresh batch?"

32 True Colors

One sunny day, William, Ava and Riley were helping at a neighborhood beautification project. An empty lot had been cleaned up, soil had been brought in, and earlier that day trees and bushes had been planted. William's father was watering them with a hose.

A professional artist had sketched a mural of the city skyline and people were painting it in. The three friends were working on a section of the sky when the artist joined them.

"Looks great," she said. "I think it's missing something, though. Let's put a rainbow right here."

She sketched an arc to show where the rainbow should go, and then left.

"Before we start painting the rainbow, we should make sure the colors are right," Ava said. "People will know we painted it and we don't want to mess up."

William said, "Okay, there's a memory trick to the colors of a rainbow...which I don't remember."

"I can't remember, either," Ava said.

"Or me," Riley said. "And it would be too embarrassing to ask. We should know this."

"Well, if we don't know and we're not willing to ask, how will we ever find out?" Ava asked.

"We'll conduct an experiment," William said. William led them to his father and asked to use the hose for a moment. William sprayed a fine mist into the sunlight, forming a spectrum of colors.

"The water droplets cause the sunlight to break into the colors that make it up, the same as what happens in the sky when water droplets create the conditions for a rainbow," William said. "Let's see, that's red, orange, yellow, green, blue, indigo, violet."

"And that reminds me of the memory trick," Riley said. "Roy G. Biv."

33 Tennis, Anyone?

"Sorry I'm late. We had to spend 10 minutes scraping the ice off the car before we could get going," Ignacio said as he joined the tennis class.

He and his friend Deshi were taking Saturday morning lessons at the tennis club's indoor courts. They both enjoyed tennis and hoped to be a doubles team when they got to high school. This was the first lesson of the new session.

The previous evening, Ignacio and Deshi had played a match there against two other friends and Ignacio's mother drove them home. On the way out, she had stopped at the front desk and bought several new cans of balls that were required for the lessons. Deshi had closed the car trunk for her when she put them inside.

Deshi's father had bought balls of the same brand for him on the way in to the lesson that morning. Since they each had new balls of the same kind, they didn't bother to keep them separate as they hit to each other to warm up.

Some of the balls bounced normally, but others seemed dead.

"What is wrong with these balls?" Ignacio asked. "Maybe we should ask for our money back."

"Before we do that, let's set the dead balls aside for a while," Deshi said. "They might go back to normal."

"You don't think they are permanently messed up?" Ignacio asked.

Deshi said, “You left the balls in the trunk of your car overnight, didn’t you? They got cold in there and lost some of their bounciness because they stiffened up. In other words, they lost elasticity when they got cold. Also, since air contracts when it gets cold, it would make the air pressure in the tennis balls lower, making them seem flat and less bouncy. When they get back to room temperature, they should be okay.”

34 Flying High

Sam and Jeffrey's grandfather had been a pilot in the Air Force years ago. One of his favorite places to take them was the annual air show at a military base nearby.

There were old biplanes, planes from World War II, and modern jets doing stunts and precision flying. There were also parachute drops, hot air balloon rides and even a blimp.

Their grandfather had flown many kinds of planes and liked to tell Sam and Jeffrey about them.

As they pulled into the parking lot, they heard a loud bang.

"I hope there wasn't a plane crash," Sam said.

"I think it was a cannon. Maybe as a signal that the show is about to start," Jeffrey said.

Their grandfather laughed. "Cannons are the Army's department, not the Air Force's. And I wouldn't worry that a plane crashed," he said. "We'd be hearing sirens if that happened."

"Wait, I remember from last time," Jeffrey said. "The sound comes from a plane, but not from a crash."

"You mean it fired a missile?" Sam asked.

"What we heard was a sonic boom," Jeffrey said. "A jet must have flown over us going faster than the speed of sound."

"Which is about 760 miles an hour, although the exact speed can vary by temperature and for other reasons," their grandfather said. "What happens is that the air in front of the airplane gets compressed so much from the high speed of the plane that it creates a shock wave that sounds like an explosion—a sonic boom."

General Science

46 Halloween Hippie

"Hey, I have an old picture of my grandma looking just like that, only it wasn't a costume to her," Kassandra said as Ingrid walked into the homeroom. "She said they actually thought they looked cool."

Their school normally had a dress code, but it was Halloween and everyone had come in that day wearing costumes. Ingrid was dressed like a hippie. She had a tie-dyed shirt, beads, sandals and sunglasses with orange lenses shaped like hearts.

Ingrid took off the sunglasses for class, but she put them back on when it was time to get ready for the Halloween party in the afternoon. The class was decorating the classroom and painting signs for the school parade.

Quan, who thought he was funny, was hanging decorations upside down; Preston was pretending to sword fight in his pirate costume with a paint brush and Ricky was playing with fake blood after putting some on his zombie costume.

When it was almost time for the parade, Kassandra noticed that one of the signs had been decorated with a red, rather than orange, pumpkin.

"Okay, who's the joker here?" Kassandra asked.

She looked around the room for a guilty face.

"I see now," Kassandra said. "It's your orange-colored sunglasses, Ingrid. They make everything look the same color to you. They're acting as filters so that light of only some colors come through to your eyes, but other colors are blocked. What you thought was orange paint is actually red. Take off those sunglasses and you'll see."

"Oops," Ingrid said, laughing. "I guess we'll just paint some flames on it and call it a pumpkin on fire!"

47 Weighting Game

"Row, row, row your boat," Antoine chuckled as he, Mikel and their cabin mates walked to the lake. It was the last full day of camp and they had prepared all week for the boat race of their cabin against another cabin of boys the same age. The boats would go from the dock, around a marker near the far end of the lake, and then back to the dock.

"Bad news, guys," a counselor named Nick said when the two groups reached the dock. He was holding the orange ball with a handle attached that was used as the floating marker.

"The rope that was holding this broke," Nick said. "I have a new rope, but now we need a new anchor to hold the marker in place. The pre-competition is to find something heavy that we can use as the anchor. The first team to come back here with something to use gets a two boat-length head start in the race."

Both teams dashed away to find something heavy. Antoine noticed the boys from the other team were going into the sports shed while his group was looking around the stable nearby.

A boy from the other cabin soon emerged from the shed carrying a bowling pin and their team started running back to the dock, laughing and cheering.

"Oh no!" Mikel said. "They found something really heavy before we did."

"Don't worry," Antoine smiled as he picked up a horseshoe.

"But they're already on their way!" Mikel said. "What can we do?"

"They may get there first, but we're going to get that head start in the boat race," Antoine said. "A bowling pin won't work as an anchor."

"But bowling pins are really heavy—heavier than a horseshoe for sure," Mikel said.

"It's not how much something weighs that determines whether it sinks in water; it's the density of the object compared with the density of water," Antoine said. "This horseshoe will sink because the density of the iron it's made of is higher than the density of water. A bowling pin is made of wood, which is less dense than water, so it will float."

48 Pooling Their Thoughts

Leo's older brother Zane had just started working as a lifeguard at their neighborhood pool. When the lifeguards weren't on duty in a chair or doing other jobs like working at the front desk, they went to their break room. It was a converted storage room down a hallway inside the bath house.

Leo knocked on the closed door and called, "Zane? Mom told me to bring you more suntan lotion. She says you look like a lobster."

"Come in," Zane said, opening the door. "Watch your step. Those floor tiles are always slippery."

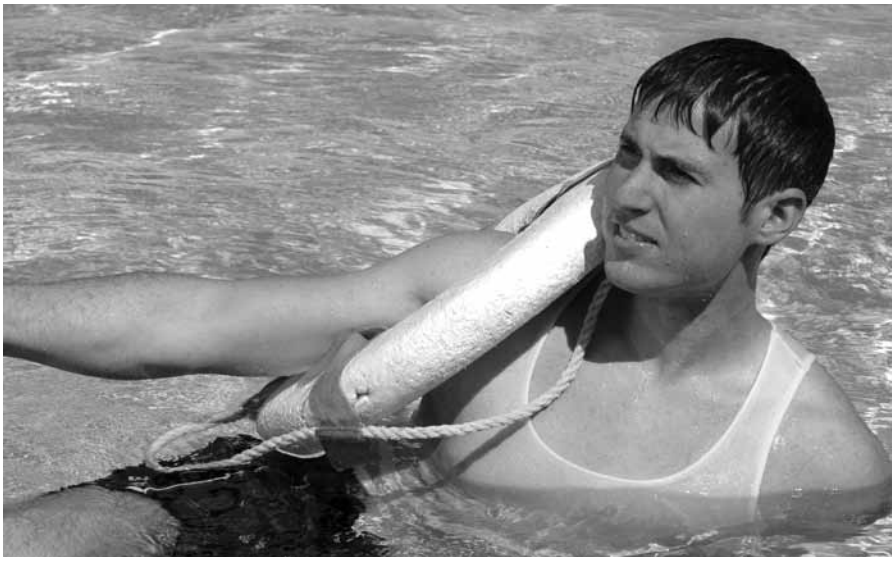
Leo looked around. The room had some old chairs and a table where several lifeguards were eating pizza. A radio was playing, and towels and swimsuits were hanging on drying racks. But what Leo noticed most was how uncomfortable the air was.

"Wow, how can you stand it in here?" Leo asked.

"Yeah, it is pretty muggy," Zane said. "There's no air conditioning and no window to open or put an air conditioner in. And they make us keep the door closed so the music doesn't bother anyone. Still, it's the only place for us to hang out."

"I know what you could do to make it feel less sticky, at least," Leo said.

"You mean get a fan?" Zane asked.



"No, a fan won't solve the problem. The problem is that the humidity of the air is so high from all these wet towels and bathing suits," Leo said. "Warm air can hold more moisture than cooler air. It feels so sticky in here because your body doesn't cool itself as well—the moisture on your skin evaporates more slowly into air that's already holding so much water. A fan will just blow that damp air around. Since there's no window for an air conditioner, what you need is a dehumidifier. If we reduce the amount of moisture in the air, it will feel cooler."

49 Science Friction

One day Ms. Joni divided her science class into three groups to use what they were learning in both her class and writing class.

"Your assignment is to make a movie poster of a science fiction movie like they did years ago," she said. "Be creative and remember those movies had a lot of action and were scary. But the basic science has to be accurate."

After a few days of working, the groups put their posters in the front of the room. The students then would judge which one was the best—no voting for their own poster allowed. The winning group would be rewarded with no homework for the weekend.

One poster was titled "Insects Take Over the Earth!" It showed an army of ants, an air force of flying grasshoppers and a spider general leading them.

The second poster showed a submarine under a sheet of ice being attacked by a giant octopus. "Lost Under the South Pole and Fighting for Their Lives!" it said.

The last was called "The Weird World Where Birds Can't Fly, but Mammals Can!" It showed birds walking along the ground looking up at furry creatures flying overhead.

"I think we have the winner," said Roxanne, who was in the third group.

"I bet you don't," said Elliott, who was in the second group. "Ours is much scarier."

"And my group's poster has a lot more action," said Erwann, who was in the first group. "What makes you think you're going to win, Roxanne?"

"All the posters showed a lot of imagination, but only one met the science requirement," Roxanne said.

"There is water under the ice at the North Pole," she continued, "but there is ground under the ice at the South Pole—the continent of Antarctica. A submarine can't go under the South Pole, and an octopus wouldn't go there anyway, because they live in warm water."

"And spiders are not insects, they're arachnids—the easy way to remember is that insects have six legs and arachnids have eight," she added. "So it's not accurate to have a spider on a poster about insects."

"I see," Elliott said. "But there are birds that don't fly, such as penguins and ostriches. And bats are mammals that do fly. So at least the idea behind your poster is based in science."

Index