

BioEdSM

WHERE'S NOAH?



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THE LUNCH BUNCH





1. MONDAY: WHERE'S NOAH?

“Walk! I said walk! Stop running!”

It was a typical day at Garfield Elementary School. Second and third graders poured into the cafetorium for lunch period. They knew they should walk, but everyone was rushing to get seats at their favorite tables. Besides, it was fun to annoy Mrs. Torres, the cafeteria aide. She would do her best to corral a few kids as groups tried to scoot by. She knew it was a game and happily played her part by pretending to be upset.

Large round folding tables, each with seats for eight students, were spread across the cafetorium floor. One wall was mostly windows. Two others were covered with painted murals of famous people, trees, animals, airplanes, rockets, planets and stars. An elevated stage at the front of the room was adorned with dark blue curtains and flanked by the U.S. and state flags. A banner with the school motto hung across the top of the curtains, “We Always Do Our Best.”

As usual, the Lunch Bunch gathered around a table in the farthest corner of the room. This table belonged to Sally, Bella, Mackenzie, Savannah, Andrew, Omar, Jacob and Noah. It was an unusual combination because some were second graders and some were third. Second and third graders never ever sat together at lunchtime, but the Lunch Bunch did.

What set them apart from the other students was that they brought lunch to school. Kids even made fun of them for not eating the school lunches. Eventually, they found each other and started sitting together. The Lunch Bunch was born. Soon, other students wanted to join, but no one was allowed in unless they brought lunch from home.



With their cartons of school milk, the Lunch Bunch tore into their brown bags and lunch boxes. Jacob, with a frown on his face, announced, “I got strawberry yogurt. Anybody want to trade?”

Sally said, “I’ll trade you carrot sticks.”

“Do you have dipping stuff?” asked Jacob.

Sally did and the swap was made. Omar traded a turkey sandwich for some pretzels. Savannah tried to exchange her cucumber and cream cheese sandwich, but no one was interested.

“Hey,” Bella asked. “Where’s Noah?”

Noah’s seat was empty.

Mackenzie and Omar, both in the same third grade class with Noah, looked at each other.

“Was Noah in class this morning?” asked Mackenzie.



“I dunno,” mumbled Omar, through a mouthful of pretzels.

“I don’t think he was there,” Mackenzie said. I don’t remember seeing him after lunch yesterday either.”

Suddenly, there was concern among the group. “Where is Noah?” they all said together.

2. WEDNESDAY A.M.: NOAH RETURNS

Two days later, Noah was back in his seat in Mrs. Wang’s third grade class. As usual, the morning started with the pledge of allegiance, school announcements and a pep talk about always doing our best.

While Mrs. Wang was taking attendance, Noah felt a tap on his shoulder. The girl behind him handed him a tightly folded square of paper. Mrs. Wang didn’t like students passing notes in class, so Noah unfolded the paper as quietly and carefully as possible. It read, “Where were you?” and was signed “Mackenzie.”



Noah turned toward Mackenzie, but before he could whisper an answer, Mrs. Wang told the class to open their notebooks to yesterday’s math homework. Noah shrugged his shoulders and turned back around. He got out his notebook and slid down in his seat, hoping Mrs. Wang wouldn’t notice him. She always said being sick was no excuse for not doing homework, but Noah had forgotten to check Mrs. Wang’s website for the assignment.

The rest of the morning was not much better, and Noah was relieved when lunchtime finally arrived. The Lunch Bunch gathered at their table and this time, Noah was present. Jacob, Omar and Andrew ripped into their lunch bags even before they sat down, but Noah just stared at his lunch box.

Across the table, Sally, Bella, Mackenzie

and Savannah watched Noah. Mackenzie spoke first. The Lunch Bunch didn't have a leader, but if they did, it would have been her.

"All right Noah, where were you?"

Noah mumbled, "I was sick."

Jacob bounced in his seat. Always looking for ways to get out of schoolwork, he asked, "Did you throw up? Awesome!"

The Lunch Bunch girls responded in chorus, "Eeuwe!"

Noah peered into his lunch box and quietly said, "I have an allergy. When I eat the wrong

thing, I get really sick and have to see a doctor right away. That's what happened Monday. After lunch, the school nurse took me to the Emergency Room. I was still sick yesterday, so I stayed home."

Jacob, Andrew and Omar high-fived each other.

"Great plan Noah! How do we get an allergy?"

Noah responded firmly, "You don't want an allergy!"

Savannah asked, "What's an allergy?"

Noah said, "It's when something makes you sick. I don't know why."

Mackenzie said, "I have an idea. We can ask Mrs. Wang what an allergy is. We'll report what we learn at lunch tomorrow."

It was a good plan.



3. WEDNESDAY P.M.: WHAT'S AN ALLERGY?

Mrs. Wang's class settled into their seats after lunch. Before Mrs. Wang could start the next activity, Mackenzie began waving her hand. She was one of Mrs. Wang's favorite students because she always asked great questions.

"Mackenzie, do you have a question?"

"Yes, Mrs. Wang. At lunch today, we were talking. We wondered, what's an allergy?"

Mrs. Wang quickly realized the reason for this question. She knew about the Lunch Bunch and what had happened to Noah. She walked to the board and picked up a marker. She wrote the words "allergy," "allergies," "allergic" and "allergen."

"Having an allergy means you are sensitive to certain things. An allergy can cause you to be very sick. For example, have any of you heard of hay fever?"

Several hands went up.

"Hay fever is an allergy. In the summer, pollen from grass and other plants fills the air. Many people are sensitive to pollen. They get itchy eyes, runny noses and sore throats. Sometimes, pollen even makes it harder to breathe. But pollen is just one example. People can have many different allergies."

Mrs. Wang pointed to the word "allergies" on the board. "'Allergies' is plural. That means more than one. People who have allergies are sensitive to several different things."



“The next word, ‘allergic,’ is an adjective. If you have a milk allergy, for example, you can say, ‘I am allergic to milk.’ The last word, ‘allergen,’ is the thing you are allergic to, like grass pollen or milk.”

By now, the whole class had become interested in the topic. Hands went up; some students told stories about their own experiences with allergies. By the time the discussion was over, Mrs. Wang had covered the board with a long list of common allergens: pollen, milk, wheat, soy, peanuts, eggs, shellfish, dust, certain medicines, dogs, cats, etc.



Mackenzie was especially interested in cat allergies. She thought about her Aunt Millie, whose three cats had the run of her house. Whenever Mackenzie visited Aunt Millie, she would sniffle and sneeze. “Could it be?” she thought. She muttered to herself, “I guess I’m just a sensitive girl.”

Ready to move on to her afternoon plans, Mrs. Wang decided to challenge her students with a special project. “If any of you are interested, you can earn extra credit by writing a report on allergies. I’ll give you one tip. Be sure to find out about the immune system.” She then wrote “Immune System” on the board.

Mackenzie and some other students lit up at the chance to improve their grades. Noah thought the report would be easy since he had an allergy. He could just write about his experience.

“Okay. Let’s get out our notebooks and turn to the science section,” said Mrs. Wang. “I’d like you each to write a summary of your observations from yesterday’s mixtures and solutions experiment.”

4. THURSDAY: MYSTERY SOLVED

Back at their corner table the next day, the Lunch Bunch did their usual food swapping as they talked about who did what in class that morning. Sally told a story of how in gym class, a basketball bounced off the top of Bella's head and went into the basket.

Omar said, "That's really using your head!"

Bella responded, "Hey, it really hurt... but it was funny."



Mackenzie, looking at Noah, said, "You never told us what allergen you are allergic to." She liked to use new words whenever possible.

Noah looked up from his sandwich and shrugged as he wiped a mustard mustache from his lips. "Peanuts," he said.

The Lunch Bunch all gave surprised looks. "Peanuts?"

"Yeah. I can't eat peanuts. Just one peanut, even a peanut crumb, makes me sick."

Still thinking he might get out of school by vomiting, Jacob asked, "Does it make you throw up?"

"It's possible, but it didn't happen this time. I got itchy skin and a rash, and then my tongue and lips started getting fatter. It was hard to breathe."

Noah paused and then added, "If I get it really bad, my throat could swell up and I won't be able to breathe at all."

"Where did you get the peanut? Savannah asked.

"I don't know."

Mackenzie, being a “sensitive girl,” noticed concern on Omar’s face. “What’s the matter, Omar?”

He held his look downward and said quietly, “I think it’s my fault.” “How could it be your fault?” asked Mackenzie.



“Noah and I traded lunches Monday.”

“Yeah,” said Noah, “but you gave me a bologna and mayo sandwich!”

Omar shook his head. “My older sister, Kaylah, likes peanut butter. She makes both of our lunches. I think she used the same knife to spread peanut butter on her sandwich and mayo on mine.”

Everyone at the Lunch Bunch table quickly understood what had happened. Some peanut butter got on the sandwich Omar traded with Noah.

Noah broke the silence. “It’s okay, Omar. You didn’t know.”

Mackenzie asked, “What happened after you ate the sandwich?”

“My mouth started tingling and I felt itchy all over. When that happens, I have to go to the school nurse. She helped me with my EpiPen.”

The Lunch Bunch looked at him strangely. Andrew asked, “What’s an EpiPen?”

Noah nodded. “It’s something I always have to carry with me.” He reached down into his backpack and pulled out a plastic tube with a yellow label.

Omar said, “I saw that before. I thought it was some sort of stupid pencil box.”

“My aunt has one, but I never asked her what it was. She always says I can’t touch it,” said Sally.

Noah looked around the group. “I don’t bring it out of my pack much. Mom says I have to keep it in the padded pocket. If I mess with the EpiPen, it might not work when I need it.”

“What do you do with it?” asked Savannah.

“When I start getting sick, I open the tube and pull out the pen. It’s pretty fat. It has a plastic tip that I hold downward.” Noah held out his arm with the tube in his fist.

“Then I press the pen tip into my leg and push it until I hear a click. A needle injects medicine into my leg, right through my pants. I count to ten, remove the EpiPen, and rub the spot for 10 seconds more.”

“Neat,” said Andrew. “Can we see the pen?”

“I can’t open it. I have to keep the pen like this until I need it.”

Noah looked at the tube. “I don’t like sticking myself. The school nurse keeps one of my pens for me. She did the injection Monday, before she took me to the emergency room. I began to feel better and my dad came and took me home.

Mackenzie asked, “What’s in the pen?”

“Epi-nepy something. I don’t know how to say it.”

Noah suddenly had a brilliant idea. He would write his extra credit report about his peanut allergy and the EpiPen.



5. FRIDAY: MRS. WANG'S CLASS

Mrs. Wang was pleased to find two allergy-extra credit reports on her desk. One was from Mackenzie—no surprise—and the other from Noah. The morning announcements were made and Mrs. Wang took attendance. Later, while small groups of students worked together solving math problems, Mrs. Wang read the two reports. Afterward, she sat back for a few moments and then called Mackenzie and Noah to her desk.

“I just read your allergy reports. Congratulations, you both did an excellent job. There’s really good information here.” Mackenzie and Noah beamed.

She then looked up and added, “In fact, I think it would be great if the other students could hear you read your reports.”

Mackenzie said, “Yes!” a bit too loudly. Noah gulped and mumbled, “Okay.”

After lunch, Mrs. Wang reminded the class about their recent discussion on allergies. She walked around the room, asking students to define the allergy words still on the board. Then she said, “I received two extra credit reports today and have asked the authors to read them to you.”

Mrs. Wang called on Mackenzie, who was already bouncing in her seat. It would be good to have her go first and give Noah a chance to prepare himself.

Immune Systems and Allergies
By Mackenzie Johnson



We all have immune systems in our bodies. The immune system waits until something bad, that can cause a disease, tries to enter our bodies. We call these bad things pathogens.

You might get a cut. A bug might bite you. Someone, with a cold, coughs on you. The pathogen gets in. If nothing is done, you get sick and could die. Viruses, that cause colds, are pathogens. Bacteria, like strep, are pathogens.

Jeremy, sitting in the back of the room, blurted out. “I had strep. It was awful.”

Mrs. Wang shook her head. “Save your comments and questions for after the reading.”

Mackenzie continued.

Like an army, the immune system attacks the pathogen and destroys it. While this is happening, you might have a stuffy nose, a cough, a fever, or a sore throat. This shows your immune system is fighting the infection.

The immune system is really important in keeping us healthy. It’s a hard job. The immune system needs to be able tell good things from bad ones. It even remembers the bad thing so that it can be ready for those bad things if they try to invade again.

In some sensitive people, mistakes are made. The immune system mistakes things that are harmless, like dust, and treats them like they’re harmful. You get a cough, a runny nose, a fever, a skin rash, or swelling. You feel awful.

You feel like you caught something, but it is your immune system



making you sick. When this happens, we say you have an allergy.
Thank you.

Mackenzie returned to her seat, feeling proud of herself. Mrs. Wang told the class that Mackenzie explained some important things that everybody should know. She listed some of Mackenzie's main points on the board. Then Mrs. Wang turned toward Noah and nodded. It was time for his presentation.

Noah reluctantly got up and brought his paper to the front of the room. In his head, he practiced pronouncing some of the words he would have to say. He coughed once and then started reading.

I Hate Peanuts
By Noah Stein

I don't eat peanuts or peanut butter. I don't eat anything with peanuts in them. Peanuts are bad for me. I have a peanut allergy.

You may think this is funny but it's not. Peanuts make me very sick. My mother told me that when I was a baby, I found a peanut and ate it. In minutes, I had a rash all over. I started getting hot. Then I stopped breathing. Dad called 911 and an ambulance came. They gave me oxygen and took me to the hospital.

That's how we learned I have a peanut allergy.

If I have anything with peanuts, I might get a rash and a fever and



I throw up. Other times, it's much worse. I have a hard time breathing and I faint.

I'm pretty good avoiding peanuts but sometimes, a peanut gets into my food. That's why I carry an EpiPen. I use the EpiPen to give myself a shot. If I'm having a peanut reaction, I use the pen to inject epinephrine into my leg.

Epinephrine helps me to breathe and prevents me from passing out. It is also good for other allergies, like bee and wasp stings.

When a person has a really bad reaction to peanuts or bees or something else, it is called anaphylactic shock. Your throat can swell so much that no air gets into your lungs. Your heart can stop and you die. The EpiPen can stop that. That's why I have an EpiPen with me at all times.



Noah moved quickly back to his seat. Mrs. Wang got up and thanked Noah and Mackenzie for their important contributions to the class.

“Let’s take some questions.” Mrs. Wang looked around the room as a few hands came up. “We’ll start with Connor.”

“Do allergies go away?”

Mrs. Wang nodded her head. “Yes, allergies can go away as you get older. Your body changes as you grow, and not just on the outside. In time, your immune system can adjust so that allergens that bother you now may not affect you when you’re older.”

“Madison?”

“My baby brother sticks everything in his mouth. Mom tries to stop him, but Dad says it’s

good for him. He says it will make my brother grow up healthy.”

“Your father is partly correct, and so is your mom. Your brother should be protected from sharp things and small objects that can be swallowed. On the other hand, by putting something dirty in his mouth—even dirt itself—your brother may be helping his immune system develop. He’s experimenting with the world. In a way, he is teaching his immune system what’s good for him, and what is bad. That will help him as he grows up.”

Juan raised his hand next.

“Yes, Juan?”

“What is epinephrine?”

“Epinephrine is a type of chemical, called a hormone, that is produced by glands in your body. When you get scared—say you’re being chased by a big dog or find yourself in some other dangerous situation—the glands release epinephrine. It’s like a super energy drink for your body. Your heart beats faster, your muscles become stronger, you can run faster, and so on. It’s one of your body’s protections when faced with peril. If you are having a serious allergy attack, epinephrine allows you to breathe again and prevents other dangerous reactions.”

“Let’s see, who haven’t I called upon? Oh, Anabell, what’s your question?”

“What is the immune system?”

“Well, we’ve already learned that the immune system is the body’s defense against harmful things, like germs. When it detects something bad



entering our bodies, it works to destroy the invader. The immune system has ways to remember invaders, so it can attack them more quickly if they come back later.

As we learned from Mackenzie’s report, allergies are mistakes made by the immune system. With allergies, the immune system treats harmless invaders—even peanuts—as though they are dangerous to the body. When the system tries to get rid of these non-harmful things, our bodies get sick.”



Mrs. Wang continued, “In scientific terms, the immune system is a collection of white blood cells, chemicals and organs that work together to fight infections in our bodies.”

Mrs. Wang pointed to Olivia. “Olivia?”
“Would you please explain anaphylaxis?”

“Anaphylaxis occurs when a person has a major allergic reaction, something like Noah described, which can happen with food allergies and insect bites and stings. The victim begins to swell, and an itchy rash appears suddenly. Blood pressure drops and there is pain all over. Breathing may become very difficult or stop altogether. The victim could even die. That’s why epinephrine is so helpful. It supercharges the body’s systems to counter the anaphylaxis.”

Without waiting to be called on, Jeremy burst out, “Can you be allergic to homework?” Many students giggled. It seemed like a great idea.

“No. Homework is always good for you. However, people can be allergic to wood and paper, and even ink. But don’t worry Jeremy. If

you have one of these allergies, you can always submit your homework by email.”

There was a disappointed sigh across the room.

Mrs. Wang looked at the clock and said, “One last question.” She pointed to Fatima.

“How do you know so much about allergies?”

“I haven’t always been a teacher. I started out as a pharmacist—you know, the person at the drug store who fills your medicine prescriptions. I had to learn about many things, including allergies, to graduate from pharmacy college. One day, my daughter invited me to her school for career day. I discovered that I really enjoyed working with students, so I went back to school and became a teacher.”

“That was a wonderful discussion, students. You all asked very good questions. Well, except for the homework question.” She smiled at Jeremy. Students began to giggle again.

“You might be thinking that Noah’s allergy is a rare thing. It’s not. There are many different kinds of allergies.” Mrs. Wang went to the board. She wrote down some numbers.



780
1 in 13
60

“The first number is how many students we have at Garfield

Elementary,” Mrs. Wang said. “The second number is a statistic. Across the United States, 1 out of every 13 kids your age has at least one allergy.” Mrs. Wang looked around the room. “That means there could be 60 students at Garfield Elementary who have allergies!”

“I have a great idea,” Mrs. Wang said. “Let’s do a scientific survey of allergies in our school. How many people have allergies? What kinds of allergies do they have? I think you will find this very interesting and a lot of fun.”

The school bell rang.

“I’ll have all the details about our survey on Monday morning. Have a great weekend and,” she looked directly at Jeremy, “don’t forget your homework.”



GLOSSARY

allergen (*AL-er-juh-n*) noun - Any substance that produces an allergy.

allergic (*uh-LUR-jik*) adjective - Having an allergy to something.

allergies (*AL-er-jees*) noun - plural for allergy: More than one allergy

allergy (*AL-er-jee*) noun - An abnormal body reaction to a substance. Usually accompanied by itchy eyes, runny nose, skin rash and difficulty breathing.

anaphylaxis (*an-uh-fuh-LAK-sis*) noun - A major body reaction to an allergen that could result in death if not treated.

epinephrine (*ep-uh-NEF-rin*) noun - A hormone secreted by the adrenal glands that stimulates body systems in times of heightened fear or excitement (sometimes called the “fight or flight” response). The hormone increases heart and respiration rates and muscle strength.

EpiPen (*EP-ee-pen*) noun - An automatic injection device that shoots epinephrine directly into the muscles. Epinephrine quickly reduces anaphylaxis symptoms.

germ (*jurm*) noun - A disease-producing microorganism (an organism so small, it must be magnified with a microscope to be visible).

infection (*in-FEK-shun*), noun: Invasion of the body by a disease-causing organism. The organism multiplies and causes different signs and symptoms, depending on the type of organism and how the immune system responds to it.

immune system (*ih-MYOON sis-tem*) noun - System that protects the body from infections and diseases. The immune system consists of white blood cells, proteins, and organs that work together.

microbe (*MAHY-krohbb*) noun - A microorganism, such as a bacteria or protozoa.

pathogen (*PATH-uh-jun*) noun - A disease-producing agent, such as a harmful virus, bacterium or microbe.