

# The Electrical Birthday Party

## CHAPTER 1

It was Chen's birthday—December 4th. All the kids had eaten cake and ice cream, put on funny hats, and played with Chen's presents. Chen had gotten lots of presents. And there were balloons. Lots of balloons, of all different colors. They had been taped to the wall and ceiling, but now the children had taken them down and were batting them around the room. One kid was going around trying to pop the balloons. Then Chen grabbed one and rubbed it on his sweater.

A funny thing happened when Chen rubbed the balloon on his sweater. The balloon stuck to the sweater! Some of the other children saw what Chen was doing and wanted to try it themselves. Soon everybody was trying to see how many balloons they could stick to their sweaters.

*Have you rubbed balloons across a sweater or wool shirt? If you have, describe what the balloons did.*

## CHAPTER 2

Margaret was Chen's friend. She was younger than Chen. This was Chen's 11<sup>th</sup> birthday, and Margaret was only 10. She was in the fifth grade. Chen and his friends were sixth graders.

Margaret was happy to be invited to Chen's birthday party, but now she was bored. There were no girls her age here. In fact, Chen hadn't invited any other girls to his party! At first, Margaret had wanted to come to see what he got, but now she was sitting all alone with nothing to do. No one was paying attention to her, and no one wanted to play with her. They just wanted to play with their stupid balloons!

Margaret had an idea. "If all these balloons stick to sweaters," she thought, maybe I can get them to stick to each other! Then I could make a big bunch of balloons and float away!"

Margaret found a blue balloon taped to the wall. She pulled the tape off and held the string in her hand. Then she found a yellow balloon attached to the ceiling. She pulled that one loose and held its string in her other hand.

Margaret rubbed the blue balloon on her sweater. It stuck to her sweater. Then she rubbed the yellow balloon on her sweater. It stuck, too. Then Margaret pulled the balloons off her sweater and tried to get them to stick to each other.



The balloons wouldn't stick! In fact, they seemed to push away from each other! "This is very strange," said Margaret. "The blue balloon is attracted to my sweater. So is the yellow balloon. But the blue balloon isn't attracted to the yellow balloon. In fact, these balloons repel each other! I wonder why."

### CHAPTER 3

"I know what to do," said Margaret. "Elvira is here. I'll go ask her."

Elvira was a friend of Chen's family. Margaret liked her a lot. She had flaming red hair and green eyes and she wore funny-looking clothes and talked in a loud voice. But she could answer any question and she sometimes showed Margaret and Chen some pretty amazing things. And best of all, she was right here in the house! She had come to Chen's birthday party and now she was talking to the grownups in the living room while Chen and his friends played with their balloons and never even noticed that they repelled.

Margaret ran to the living room with her balloons. Chen's mother and father were there with Elvira. "Look what I discovered!" she said. She pointed to the balloons. "They repel each other," she said, "but they're both attracted to my sweater."

"That's nice, dear," said Chen's mother.

"What were you expecting to happen?" asked Elvira.

"I thought when I rubbed them on my sweater the balloons would get all sticky," said Margaret. "But that didn't happen. They don't stick to each other. See, they push each other apart!"

“That’s because they both have the same kind of charge,” said Elvira. “If you want, I’ll show you.” She stood up and looked at Chen’s parents. “Will you excuse me a moment?” she said. She picked up a large cloth bag in one hand. Then she turned to Margaret and waved her other hand in a grand gesture. “Take me to your balloons!” she cried.



## CHAPTER 4

Back in the playroom Chen and his friends were hitting each other with the balloons. One boy popped a balloon and everybody laughed.

"Hush!" said Elvira. She said it rather quietly, but somehow everyone heard her. They all quieted down and looked at Elvira.

"Margaret has something to show you," said Elvira. "Show them, Margaret."

Margaret showed them how the balloons pushed each other apart. "They repel," she said, "but I don't know why."

"I'm going to show you all why," said Elvira. "Watch!"



She reached into her cloth bag and took out a strange-looking object. It looked kind of like a magnifying glass, but it was much bigger than any magnifying glass Margaret had ever seen. The lens was square instead of round and it was almost as big as Margaret's head. The handle was long and thick and it had about a dozen buttons and switches on it.

"I've seen one of those before," said Chen. "We have them in school. It's called a magnifying glass."

"Ah, but this magnifying glass is different!" replied Elvira. "Wait till you see what it can do!"

## CHAPTER 5

Elvira said, "This is a special magnifying glass for looking at electric charges."

"What are electric charges?" asked Chen.

"I know, I know!" said Tommy. Tommy was one of Chen's friends who had been invited to the party. He waved both hands in the air and jumped up and down, but Elvira ignored him.

"Electric charges come in two kinds," she said, "positive and negative. Everything in the world is made up of electric charges and there are usually just as many positive charges as negative charges."

Margaret asked, "Can we see them through your magnifying glass?"

"Not unless they are separated," said Elvira. "When the positive and negative charges are together, they cancel each other out. They become invisible. You can't see them, even with this special magnifying glass."

"So what good is that thing, anyway?" said Chen. "If it can't see charges, what is it good for?"



"It can see them," said Elvira. "Weren't you listening? We just have to separate the negative charges from the positive charges, so they won't cancel out."

"And how do we do that?" said Chen.

"You've been doing it all afternoon," said Elvira. "Whenever you rub a balloon on your sweater, some of the charge separates. Here, I'll show you. Give me a balloon."

Elvira rubbed the balloon on Chen's sweater and then she put the magnifying glass up close to the balloon. Chen looked through the magnifying glass. "I see a bunch of little tiny minus signs on this side of the balloon!" he announced. He turned the balloon over. "But there are no minus signs on the other side."

"That's because you only rubbed one side of the balloon," said Elvira. "The charge only separates where you rub."

"Those minus signs represent negative charge," said Elvira. "When you rubbed the balloon, you separated the two kinds of charges. The negative charge moved to the balloon, leaving the positive charge behind on the sweater."

"So the sweater should have a bunch of plus signs on it?" asked Chen.

"Let's find out!" said Elvira. She held the magnifying glass close to Chen's sweater. Margaret looked through it.

"It does!" she announced. "It has plus signs, but only on the side that rubbed the balloon."



Then all the kids had to have a turn looking at the minus signs on the balloon and the plus signs on the sweater. When everyone had seen them, Chen said, "I still don't see what all these plus and minus signs have to do with the balloons sticking to the sweaters."

"Yes," said Margaret, "and why don't the balloons stick to each other?"

"It's very simple," said Elvira.

## CHAPTER 6

"Positive and negative charges attract each other," said Elvira. "They like to be close to each other. And most of the time, in most materials, they're so close to each other that their charges cancel out. That's why most objects don't attract each other."

"But when you guys rubbed those balloons on your sweaters, you separated the charges. You gave a little extra negative charge to the balloons and the same amount of positive charge to the sweaters. Then, when you brought the balloons close to the sweaters, the negative charges attracted the positive ones and the balloons stuck to the sweaters."

"I got that part," said Margaret, "but if charges attract the way you say, then why do my balloons repel each other?"

"Take a look at those balloons through the magnifying glass," said Elvira. "What do you see?"

Margaret put the magnifying glass close to one of the balloons. "I see little minus signs on this one," she said. She grabbed the other balloon. "And there are minus signs on this one, too. They're both negative."

"Aha!" said Elvira, "See, that explains it!"

"Explains what?" asked Chen. "I don't get this!"

"I told you that unlike charges attract," said Elvira. "Positive charges attract negative charges and negative charges attract positive ones. But I never told you what happens when the two charges are the same kind. Now Margaret has just done an experiment that answers that question."

"When the charges are the same kind, they repel!" said Margaret. "All the balloons are negative in this experiment, so they're all going to push away from each other."

Elvira held her hand up high and talked to the rest of the children. "Margaret just made a prediction based on her theory," she told them. "She thinks that all the balloons will repel each other, not just these two. What do you think? How will you find out?"

Everyone ran around gathering up balloons, rubbing them on their sweaters, and then trying to stick them to each other. All the balloons repelled each other.

*What would happen if two negatively charged objects were brought together?*

"I've got a prediction, too!" said Chen. "The sweaters in our experiment all have the same charge, too. All the balloons are negative and all the sweaters are positive. The sweaters should repel each other, too."



They tried it. The sweaters were heavier than the balloons and they didn't float around, so it was harder to see what was happening. But Tommy saved the day. He had brought a wool scarf to the party. The scarf was lighter than the sweaters and when the children rubbed the two ends with a balloon, they pushed on each other just the way the balloons had. When the children looked through Elvira's magnifying glass the scarf had little plus signs on it, just like the sweaters.

"We've proved that positive charges repel each other, too," Chen announced proudly.

## CHAPTER 7

When all his friends had gone home Chen looked around the room. The table was covered with the paper plates and cups. Most of the cups were half full and some of the plates still had cake and melted ice cream on them. The tablecloth was made of paper, too. It was torn in places and ice cream and juice had been dripped on it. On the floor were all the presents Chen had received. Some of them were still in their wrapping paper. There were balloons everywhere—on the ceiling, on the walls, under the table, even in the bathroom!



Chen's parents and Elvira were cleaning up. Chen was helping. Margaret had left, and she said she had a great time.

"That was the best party ever!" said Chen.

"I'm glad you enjoyed it," said his mother. "What part did you like best? The presents, the games?"

"I'm guessing the cake!" said his father.

"No," said Chen, smiling up at Elvira, "It was the balloons."

**THE END**

*Describe something you learned from this story.*