

CONDUCTORS — and — INSULATORS

Electrical Circuits Conductors and Insulators

Correlation

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Sasha, Darrell, and Maria were all at Maria's house. Sasha and Darrell were invited to meet the new dog Maria's family adopted from the animal shelter. They were all in the family room playing with the new dog on the floor.

"Now I understand why you named him Volt!" said Darrell. "He has more energy than a power plant."

"Darrell, sometimes your sense of humor is truly shocking!" joked Sasha. "By the way, Darrell, I have a joke for you. How many gorillas does it take to change a light bulb?"

"I know. Just one, Sasha, but it takes a lot of light bulbs!" said Darrell.

"Okay you two. That is enough of the bad jokes," said Maria. "But you are right, Darrell. We named him Volt because he was so energetic. Do you want to go outside and take Volt for a walk around the block?"



"That sounds like a wonderful idea!" exclaimed Sasha.

The three friends went outside with Volt. They walked down the sidewalk together.

The three friends had walked all the way around the block and were now back at Maria's house. It was approaching dinnertime.

"I have to head home now," Sasha said. "My mom is cooking my favorite macaroni and cheese supper tonight. Thanks for letting me play with your new puppy, Maria."

"I really enjoyed myself, too," said Darrell. "But before I go I have one last question to ask you both."

"What?" asked Maria and Sasha.

"How many girls does it take to change a light bulb?" grinned Darrell.

Maria rolled her eyes and groaned. But Sasha thought of a good response.

"Absolutely none!" said Sasha. "They are smart enough to use fluorescent bulbs. They hardly ever need changing!"

Darrell just grinned and waved to his two friends as he walked down the sidewalk.



"I was driving with my mom one day during a torrential rain storm," stated Sasha. "There was a constant flash of lightning and the roar of thunder. A utility pole had been struck by a bolt of lightning. It was completely blocking the road. There were branches everywhere, and the wire was sparking. The police closed the entire street down. They set up a detour, and the traffic had to go an alternate route."



"That was really dangerous!" Darrell replied. "It was even worse because the road was wet from the storm. Water is an excellent conductor of electricity. For that reason, you should always be careful using electrical appliances in the bathroom or near the sink in the kitchen. Water and electricity together makes for a potentially deadly combination."

"What other materials are good conductors?" asked Maria.

"Most electrical wires are made from metals like copper," Darrell said. "Copper is an excellent conductor of electricity."



"I am sorry I got carried away with the energy jokes, Maria. I guess I'm still thinking about that dream I had a while ago. It wasn't a nightmare, but I can't get it out of my head. Do you remember, Maria? I told you all about it," Darrell said.

"There is no need to apologize," said Maria. "I think your jokes are hilarious, and that was a really weird dream."

"I'm in the dark about this. What dream?" asked Sasha. "I don't think you told me about it."

"I had a dream that I was being transported through high voltage wires. I started out at the power plant and followed the same path as the electricity all the way back to my house," said Darrell. "There was this man in a construction helmet named Mr. Charge. He explained all about how electricity is generated. That's how I learned so much about electricity. When I woke up, I felt like the dream had actually happened."

"Now that is what I call a strange dream," said Sasha.



Suddenly, Volt began to bark and tug at the leash Maria was holding. Volt had noticed a squirrel in a tree. Volt's barking frightened the squirrel. It leaped onto a power line and quickly scooted across the street.

"Darrell, I have a question to ask you," Maria said. "How can squirrels safely walk on high voltage wires? Don't those wires contain very powerful electricity?"

"Yes, Maria, they certainly do," answered Darrell. "Some squirrels are not as fortunate as that one was. That wire must have been well insulated."

"What does that mean?" asked Sasha.

"It means that the wires are covered with a type of material that does not conduct electricity very well," said Maria.

"You are exactly correct," Darrell said. "Materials like glass, plastic and rubber are excellent insulators. They are used to coat electrical wires to keep the flow of electricity contained."



"I have noticed that where the wires are attached to the utility poles, sometimes there are glass bell-shaped objects," Sasha said. "Are those the insulators?"

"I believe you are right," Maria added. "If the wires were not insulated where they come in contact with the pole, the electricity would be conducted down the pole to the sidewalk."

"That would be extremely dangerous," Darrell said.

