

D3. Static Electricity

Static Electricity

Have you ever experienced a little shock when touching a doorknob or another person? That's called static electricity! It's like magic, but it's all about tiny particles called electrons.

What is Static Electricity?

Electricity is the flow of tiny particles called electrons. In most cases, electricity flows through wires to power our homes and gadgets. But sometimes, these electrons can stay in one place, causing static electricity.

Where Do Electrons Come From?

Everything around us is made up of atoms, and atoms are made up of even tinier particles: protons, neutrons, and electrons. Electrons are negatively charged, and they like to move around.

The Electric Dance

Imagine you have two balloons. When you rub them against your hair, some electrons from your hair move to the balloons, giving them a negative charge. Since opposite charges attract, the balloons will stick to each other. This is the electric dance!

How Does Static Electricity Happen?

Static electricity happens when two objects rub against each other, and one of them loses some electrons while the other gains them. The object that loses electrons becomes positively charged, and the one that gains electrons becomes negatively charged.

Why Does Your Hair Stand on End?

If you rub a balloon against your hair, your hair might stand on end and stick to the balloon. This happens because the negative charge from the balloon makes your hair strands repel each other, causing them to stand up.

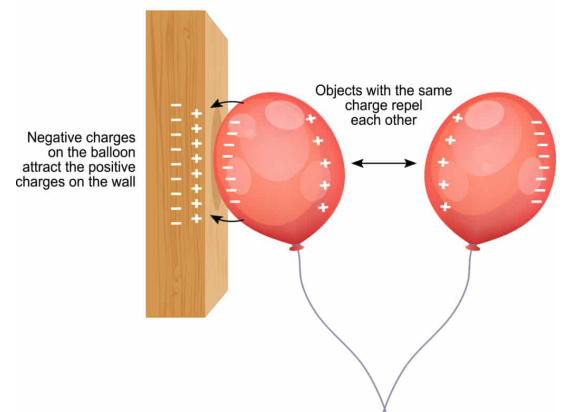
Lightning: Nature's Static Electricity

One of the most powerful displays of static electricity is lightning. Thunderclouds are full of tiny ice crystals and water droplets that bump into each other as they move around. This rubbing creates static electricity, and when it becomes strong enough, it causes lightning to strike!

Static Electricity and Clothes

You might have noticed that some fabrics create more static electricity than others. This is because certain fabrics, like wool or polyester, don't let electrons move as freely as other

STATIC ELECTRICITY



materials, like cotton. When you remove clothes made from these fabrics, they might crackle and create sparks due to static electricity.

Static Electricity and Balloons

Balloons are a great way to see static electricity in action. When you rub a balloon on your hair or a piece of cloth, it gains a negative charge. This negative charge attracts the positive charges in the wall, making the balloon stick to it for a moment before falling down.

Electric Discharge

Static electricity can build up in an object and then suddenly discharge, causing a spark. You might have experienced this when touching a metal doorknob after walking on a carpeted floor. The spark happens as the excess electrons jump from you to the doorknob to balance the charges.

1. What causes static electricity?
 - A) The flow of protons
 - B) The flow of electrons
 - C) The flow of neutrons
 - D) The flow of atoms
2. Which particle is negatively charged and likes to move around in atoms?
 - A) Protons
 - B) Neutrons
 - C) Electrons
 - D) Ions
3. What happens when two objects rub against each other and one loses electrons while the other gains them?
 - A) They both become positively charged
 - B) They both become negatively charged
 - C) One becomes positively charged, and the other becomes negatively charged
 - D) Nothing happens
4. Why does your hair stand on end when you rub a balloon against it?
 - A) The balloon gives your hair positive charge
 - B) The balloon gives your hair negative charge
 - C) The balloon makes your hair heavy
 - D) The balloon makes your hair longer
5. What causes lightning?
 - A) Static electricity in thunderclouds
 - B) Static electricity in the ground
 - C) Static electricity in the air
 - D) Static electricity in the ocean
6. Why do some fabrics create more static electricity than others?

- A) They are softer
 - B) They don't let electrons move freely
 - C) They are colorful
 - D) They are thicker
7. What happens when you rub a balloon on your hair and then place it near a wall?
- A) The balloon will fall down immediately
 - B) The balloon will stick to the wall for a moment and then fall down
 - C) The balloon will stick to the wall permanently
 - D) The balloon will pop
8. What is electric discharge?
- A) The flow of electricity through wires
 - B) The flow of electricity in lightning
 - C) The sudden discharge of static electricity, causing a spark
 - D) The movement of electrons in the air
9. What is lightning?
- A) A type of balloon
 - B) A powerful display of static electricity in thunderclouds
 - C) A type of fabric
 - D) A type of electric discharge
10. What causes a spark when you touch a metal doorknob after walking on a carpeted floor?
- A) The metal doorknob is charged with positive electrons
 - B) The metal doorknob is charged with negative electrons
 - C) The metal doorknob is charged with protons
 - D) The metal doorknob is charged with neutrons

ANSWERS & EXPLANATIONS

1. B - The flow of electrons.
 - Static electricity is the flow of tiny particles called electrons.
2. C - Electrons.
 - Electrons are negatively charged and like to move around in atoms.
3. C - One becomes positively charged, and the other becomes negatively charged.
 - When two objects rub against each other, one loses electrons and becomes positively charged, while the other gains electrons and becomes negatively charged.
4. B - The balloon gives your hair negative charge.
 - When you rub a balloon against your hair, it gains a negative charge, causing your hair strands to repel each other and stand on end.
5. A - Static electricity in thunderclouds.
 - Lightning is caused by static electricity buildup in thunderclouds.
6. B - They don't let electrons move freely.
 - Fabrics that create more static electricity, like wool or polyester, don't let electrons move as freely as other materials like cotton.
7. B - The balloon will stick to the wall for a moment and then fall down.
 - The negative charge on the balloon attracts the positive charges in the wall, making the balloon stick to it for a moment before falling down.
8. C - The sudden discharge of static electricity, causing a spark.
 - Electric discharge is the sudden release of static electricity, causing a spark.
9. B - A powerful display of static electricity in thunderclouds.
 - Lightning is a powerful display of static electricity in thunderclouds.
10. B - The metal doorknob is charged with negative electrons.
 - When you touch a metal doorknob after walking on a carpeted floor, the spark is caused by the excess electrons jumping from you to the doorknob, balancing the charges.