

Static Electricity

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

A balloon is rubbed on a wool jumper and becomes negatively charged. What happened?

Step 1 · Particles that move

Friction moves electrons (tiny negative particles) from one material to the other.

Step 2 · Balloon

Electrons moved from the jumper onto the balloon, so the balloon has extra negative charge.

Step 3 · Jumper

The jumper lost electrons, so it is left positively charged.

Answer: Electrons moved from the jumper to the balloon

Check: Only electrons move; positive charges stay where they are.

2. Now try one with the steps

Two balloons are both rubbed on the same jumper and hung near each other. What happens?

Step 1 · Charges

Step 2 · Rule

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Which particles move when two materials are rubbed together? [1]

2. What is the charge on an electron? [1]

3. A balloon gains electrons. What charge does it have? [1]

4. The jumper the balloon was rubbed on loses electrons. What charge does it have? [1]

5. Complete: like charges ____; unlike charges _____. [1]
6. Two balloons are both rubbed on a jumper. What happens when they are brought together, and why? [2]
7. In a model, each rub moves 5 electrons onto a balloon. After 6 rubs, how many electrons has the jumper lost? [1]
8. Explain why a charged balloon sticks to a wall. [3]
9. What is an electric field? [1]
10. Is the electrostatic force a contact or non-contact force? [1]
11. Why is it hard to charge a metal rod by rubbing it while holding it in your hand? [2]
12. Explain how lightning forms, in terms of charge. [2]
13. Why must a fuel tanker be earthed before unloading? [2]
14. Give one useful application of static electricity. [1]

4. Before you hand it in

"Positive charges move onto the jumper."

Only electrons move. Losing electrons makes something positive.

"Rubbing creates charge."

The total charge stays the same: what one object gains, the other loses.

"Only charged objects can be attracted."

A charged balloon attracts small bits of paper and walls by inducing opposite charge on their surface.