

# Worksheet | Lower Secondary Stage (6-8)

Answer key.

1<sup>st</sup> Semester | 2023-2024

Subject: Physics

Chapter: Electricity

Objectives:

- Use a simple model to describe electricity as a flow of electrons around a circuit.
- Describe the Rutherford model of the structure of an atom.
- Describe electrical conductors as substances that allow electrons to flow and electrical insulators as substances that inhibit electron flow.

## Activity 1

Complete the following sentences. Just write the missing word on the line below.

An object which has a negative charge is said to have more electrons than protons.  
[1 mark]

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An object which has a positive charge is said to have less electrons than protons.  
[1 mark]

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Sarah uses a plastic comb to comb her hair. The comb becomes negatively charged. The comb is negatively charged because the comb has: [1 mark]

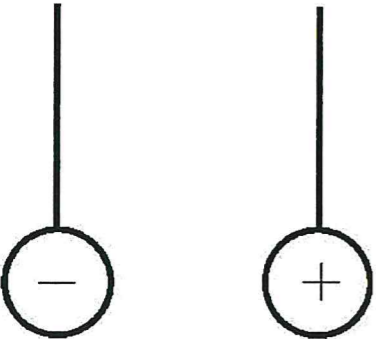

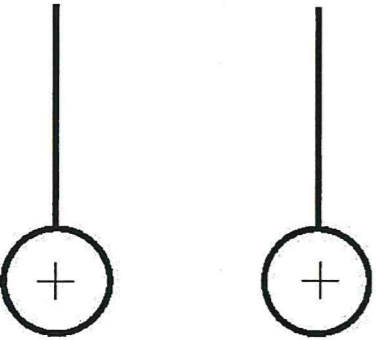
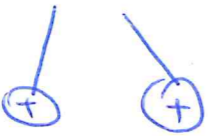
1. gained electrons
2. gained protons
3. lost electrons
4. lost protons

A perspex strip was rubbed with a cloth and became positively charged. The correct explanation for why the perspex rod becomes positively charged is that: [1 mark]

1. the perspex rod got extra protons from the cloth.
2. the perspex rod got extra protons due to friction.
3. protons were created as the result of friction.
4. the perspex rod lost electrons to the cloth due to friction.

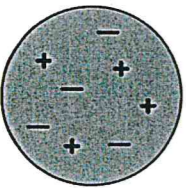
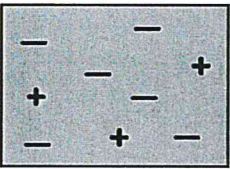
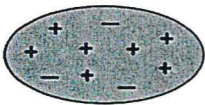
### Activity 2

Look at the following images in the table. Redraw the images in the second column to show how the spheres will move because of the nature of the charges. Write an explanation in the last column. [6 marks]

Charged spheres	Draw how they will move	Explanation
		unlike charges attract OR Opp. charges attract
		Like charges repel

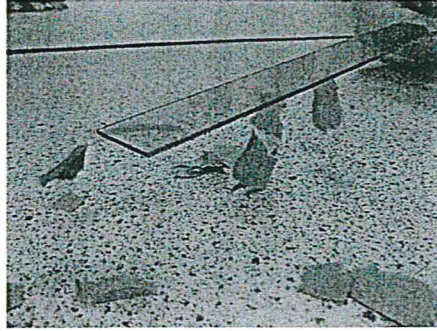
### Activity 3

Complete the table by working out the overall charge on each object. Show your calculations. State whether the object is positively charged, negatively charged or neutral and why. [9 marks]

Object	Overall charge	Why is it positive, negative or neutral?
	Neutral	Electrons = protons
	Negative	Electrons > protons
	Positive	Electrons < protons

Activity 4

The ruler in this photo has been rubbed with a cloth. Describe what is happening in this photo and why. [4 marks]



What is happening?

Rubbing the ruler with a cloth will charge it due to friction, the charged ruler will attract the pieces of paper due to the imbalance of charge.

Sometimes, when you are pushing a trolley, you can get a small shock. Explain why this would happen. [2 mark]

As the trolley moves there will be friction between the wheels and the floor, this would cause the trolley to get charged. The trolley will shock us due to the difference in charge between us and the trolley.

Why does your jersey make a crackling sound when you pull it over your head? [2 mark]

As we take off the jersey, it gets charged by the friction with our hair, the crackling sound it makes is the movement of electrons.