

Science 10

Review Guide of Electricity

In order to do well on the Test on Electricity, students must:

1. Know the definitions to all the following terms:

static electricity

positive charge

negative charge

neutral

induced charge

coulomb

ampere

current

voltage

resistance

rheostat

conductor

insulator

schematic diagram

milliampere

volt

electrochemical cell

battery

electrical circuit

pathway

series

parallel

electron flow

conventional current

a joule

an ohm (Ω)

2. Know that an object with a + static charge has less electrons than protons.
3. Know that an object with a - static charge has more electrons than protons.
4. Know the rules of static electricity. (Opposite charges attract, Like charges repel, + and - charges Both attract Neutral)
5. Know that static charges can be transferred from one object to another.
6. Know how electrons move in objects to produce **induced charges** when another charged object is brought close but not touching.
7. Know some practical applications of and dangers of static electricity.
8. Know that when cells are connected in series (+ - + - etc.), their voltages add up. (eg. a 3.0 volt cell in series with a 9.0 volt cell will give a total voltage of 12.0 volts)
9. Know that when cells are connected in parallel, the total voltage is only equal to the voltage of the cell with highest voltage. (eg. If three 1.5 V cells are in parallel, the total voltage is 1.5 V. If a 3.0 V cell is in parallel with a 1.5 V cell, the total voltage will be 3.0 V.)
10. Know that cells with equal voltage are connected with like terminals connected, the voltage will be zero. (eg. Two 1.5 cells connected: + - - + or - + + - will give a total voltage of 0 V)
11. Know how to count the number of pathways in all types of electrical circuits. In a simple series circuit, there is only one pathway. In a parallel circuit, there is a pathway for every branch. (eg. A circuit with 3 resistors in parallel would have 3 pathways)
12. Know how to draw schematic (containing accepted symbols) diagrams for series and parallel circuits.
13. Know that a **Volt** is a Joule of energy per Coulomb of charge (electrons).
14. Know that an **Ampere** (A) is the flow of 1 Coulomb of electrons per second.

15. Know that **electrons flow** from the - terminal of the battery, through the external circuit and back to the + terminal of the battery.
16. Know that **conventional current flows** from the + terminal of the battery, through the external circuit and back to the - terminal of the battery.
17. Be able to determine what happens to the current in various places in a circuit when a wire is cut or a switch opened or a circuit component removed somewhere.
18. Know that when more resistors (or lamps) are added in **series**, that the **total resistance increases** and the **total current decreases**.
19. Know that when more resistors (or lamps) are added in **parallel**, that the **total resistance decreases** and the **total current increases**.
20. How to convert Amperes to mA and mA to Amperes.
21. How to read voltage on multirange voltmeters.
22. How to read current on multirange ammeters.
23. How to use Ohm's Law to Calculate V (voltage), I (current) or R (resistance) given two of these quantities.
24. How to apply Ohm's Law to diagrams of electrical circuits to find V, I or R of components in the diagrams.
25. Know that the **CURRENT IS THE SAME** at all places in a **SERIES** circuit. This is because there is only **ONE PATHWAY**.
26. Know that the **VOLTAGE ACROSS EACH RESISTOR** in a circuit with **RESISTORS IN PARALLEL** is **THE SAME**.
27. Know that the current through each resistor in a parallel circuit can be calculated using:
 $I = V/R$.
28. Know that the currents through each resistor in a **parallel** circuit **ADD UP** to the **TOTAL CURRENT** in the branch with the battery.
29. Know that the slope of a graph of **Voltage vs. Current** gives the value of **Resistance**.
30. Know that resistors convert **electrical potential energy** into **heat energy**.
31. Know that if one lamp in a circuit with lamps in **parallel** is removed or burns out, the other lamps will continue to light up. (more than one pathway and only one pathway is broken)
32. Know that if one lamp in a circuit with lamps in **series** is removed or burns out, the other lamps will go out. (only one pathway and it is broken)