

Intermediate Science 9
Unit 3: ELECTRICITY
STUDY GUIDE: CURRENT ELECTRICITY

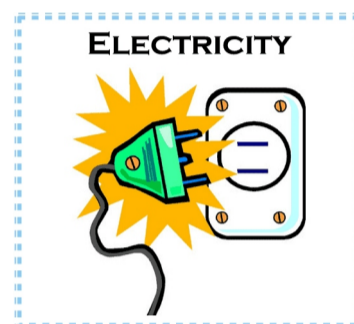


Know the following terms:

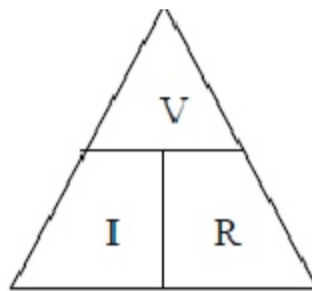
Current Electricity	Current	Electric Potential Energy
Electric potential difference	Voltage	Cell
Battery	electrolyte	Electric circuit
Switch	Voltmeter	Ammeter
Resistance		

Know the following:

1. Define current electricity.
2. Compare static electricity and electric current .
3. Define potential energy.
4. Define electric potential difference (voltage).
5. Describe how an electrochemical cell produces a supply of electric charge. Include:
 - (i) 2 electrodes of different materials
 - (ii) electrolyte
6. Define electric circuit.
7. describe the parts of an electric circuit. Include:
 - (i) Source of electrical energy
 - (ii) Electrical load
 - (iii) Control/switch
 - (iv) Conductor
8. Create circuit diagrams using appropriate circuit symbols. Include symbols for:
 - (i) bulb
 - (ii) cell
 - (iii) battery
 - (iv) wires
 - (v) resistors
 - (vi) ammeter
 - (vii) voltmeter
 - (viii) open switch
 - (ix) closed switch
9. Define electrical resistance.
10. identify the ohm (Ω) as the SI unit for electrical resistance.



11. list the factors which affect the amount of resistance in a wire. Include:
 - (i) Length
 - (ii) Diameter
 - (iii) Type
 - (iv) Temperature
12. State Ohm's Law - given voltage drop and current through a resistor, calculate its resistance.
13. Given voltage drop and resistance, calculate current through a resistor.
14. Given current through a resistor and its resistance, calculate the voltage drop



15. Use an ammeter and voltmeter to measure current and voltage in a circuit .
16. Give examples of situations where parallel and series connections of resistors are used. Include:
 - i. Christmas lights connected in series versus parallel
 - ii. household lights connected in parallel.
17. Describe positive and negative effects of parallel and series connections of resistors (or bulbs). Include:
 - i. if bulbs are connected in series, when one light extinguishes so must all others.
 - ii. if bulbs are connected in parallel, when one light extinguishes, the remaining can continue to function
18. Describe the effect on the total resistance of the circuit as resistors are added:
 - i. in series => Higher
 - ii. in parallel => lower
19. Describe pros and cons of parallel and series connections of cells.
 - i) distinguish between series and parallel connections of cells
 - ii) indicate that series connections of cells increase the effective voltage, but the resulting battery life is shortened.
 - iii) indicate that parallel connections maintain the effective voltage, but the resulting battery life is lengthened
 - iv) determine the effective voltage for cells connected in series and parallel.
20. What is the function of the following in our daily lives
 - i. fuses
 - ii. circuit breakers
21. Identify the Watt (W) as the unit to measure electrical power.

22. recognize that electrical energy cost depends on three factors. Include:
 - i. voltage drop
 - ii. electrical current
 - iii. time
23. Given electrical energy used and cost of electrical energy, determine cost to consumer
24. Propose a course of action that reduces the consumption of electrical energy. Include:
 - i. for homes heated by electricity, improve insulating factors
 - ii. turn off lights when not required
 - iii. use energy-efficient light bulbs
 - iv. air dry clothes when possible
25. Given useful output energy and input energy, calculate efficiency of an electrical device
26. Recognize that electrical energy is converted to many other forms. Include:
 - i. light
 - ii. heat
 - iii. sound
27. Recognize that Energuide labels are used to aid customers.
28. Describe the transfer and conversion of energy from a generating station to the home.
29. Identify the components of an electrical generator. Include:
 - i. coil of wire
 - ii. magnets
30. Describe different types of electrical generating stations. Include:
 - i. hydroelectric
 - ii. thermal
 - iii. nuclear
31. give examples of alternative sources of electrical energy. Include:
 - i. wind generator
 - ii. solar energy
 - iii. fuel cell
32. understand that the development of alternative sources of energy as constrained by several factors. Include:
 - i. cost
 - ii. availability of materials
 - iii. properties of materials
33. Understand that electrical energy is transmitted over large distances at high voltage and low current.
34. Define transformer
35. Recognize that voltage is provided at 120 V and 240 V for domestic

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Joke:

What is the name of the first electricity detective?

Answer: Sherlock Ohms

