


Science Department
Current and Circuits
AY: 24-25
Term: 3
Date: -----
Grade:10
Name: ----- Section: -----
NGSS
HS-PS2-6
Level 1
1.1 match the vocabulary word with the correct definition

1. Electric current
2. Conventional current
3. Battery
4. Electric circuit
5. Ampere
6. Resistance
7. Resistor
8. Parallel connection
9. Series connection
10. Electric potential difference

A. The work needed to move a positive test charge between two points in an electric field divided by the charge
B. A flow of charged particles
C. The direction in which a positive test charge moves
D. A device made up of several galvanic cells that converts chemical energy into electrical energy
E. Any closed loop or pathway that allows electric charges to flow
F. A flow of electric charge equal to one coulomb per second
G. A measure of how strongly a material opposes the flow of current
H. A device designed to have a specific resistance
I. A connection in which current has two or more paths
J. A connection with only one path for current

1.2 Explain how you can maintain a potential difference between two plates connected by a conductor?

1.3 Explain why electrons and conventional current move in opposite directions?

1.4 Why must a circuit be closed for current to flow?

1.5 Explain how energy is conserved in electric circuit?

1.6 Why do most metals obey Ohm's law?

Level 2

2. calculations:

Use:

$I = \frac{q}{t} / P = I\Delta V / E = Pt / V = IR$

2.1 Charge Flow

A charge of 10 C flows in 5 s.
Find the current.

2.2 Power Calculation

A 120 V device draws 10 A.
Find:
a) Power
b) Energy used in 2 hours

2.3 Ohm's Law

A 9 V battery is connected to a

 Ω resistor.

Find the current.

2.4 Mixed Problem

A motor in a circuit uses:

- Voltage = 12 V
- Current = 0.75 A
- Time = 5 minutes

Find:

- Power
- Energy

3. Series vs Parallel

3.1 Complete the table:

Property	Series Circuit	Parallel Circuit
Current		
Voltage		
Paths		

3.2 Circuit Behavior

What happens when:

a) One bulb breaks in a series circuit? _____

b) One bulb breaks in a parallel circuit? _____

3.3 Instruments

• What does an ammeter measure? _____

• What does a voltmeter measure? _____

• Why is a voltmeter connected in parallel? _____

Level 3

4. Real-Life Applications

4.1 . UAE Homes (Electricity System)

Homes in the UAE use parallel circuits.

Explain why this is safer and more practical.

4.2 Power Transmission (Across UAE Desert)

Why is electricity transmitted at high voltage in the UAE?

Answer using:

- Current
- Energy loss

5. Critical Thinking

1. If resistance increases, what happens to current? Explain using physics.
2. Why do resistors produce heat?
3. A student says: “Increasing voltage always increases resistance.” Is this correct? Explain.
4. Why are long wires more resistive than short wires?