Physical Science 10: Circuit Electricity Review Mr. P. MacDonald

Vocabulary Review

- alternating current (AC)
- direct current (DC)
- electric conductor
- electric current
- electric insulator
- Ohm's law
- resistance
- voltage
- electric circuit
- parallel circuit
- series circuit
- voltage drop
- equivalent resistance
- Ammeter
- Voltmeter

From Chapter 23.2

1. What is electric current?
2. What is the difference between direct and alternating current?
3. Define voltage.
4. List three sources of voltage.
5. Identify three properties that affect the resistance of a given material.

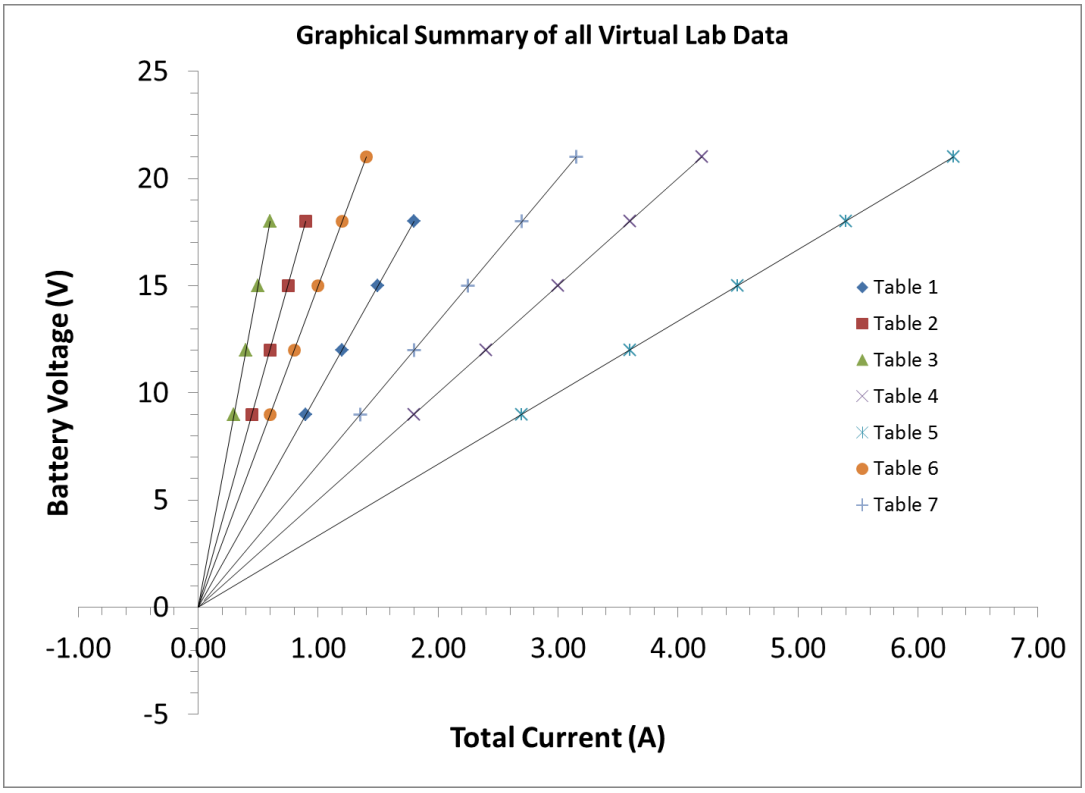
Circuit Diagrams

- Baeries, a switch, and one light.
- Baeries, a switch, and two lights.
- Baeries, a switch, and three lights.
- Baeries, a switch that controls all lights at once, and two lights in parallel.
- Baeries, two lights in parallel, and two switches (one to control each light).
- Baeries, three lights in parallel, and one switch to control them all.

Labs

1. In a series circuit, what does the voltage drop of each light bulb (resistor) add up to? How does the current from the battery compare to the current going through each light bulb?
2. In a parallel circuit, what is the voltage drop of each bulb compared to the total voltage of the battery? What do the individual currents add up to?
3. Should a circuit be constructed in series or parallel to have the lowest equivalent resistance?
4. Sketch a graph of Voltage vs. Time for circuit powered by an AC and DC generator.
5. Suppose you had a circuit with one light bulb, then to that circuit you add another bulb in series. Did the equivalent resistance increase or decrease? Suppose instead you added that second bulb in parallel, did the equivalent resistance increase or decrease?
6. Should an ammeter be connected in series or parallel with a light bulb?
7. Should a voltmeter be connected in series or parallel with a light bulb?
8. Increasing the voltage of a circuit will increase or decrease the current?

Use this graph for the next 4 questions.

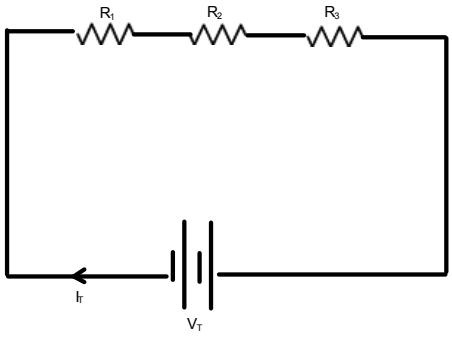


1. Is the mathematical relationship between battery voltage and total current linear or non-linear?
2. Which table of data represents a circuit with the lowest equivalent resistance?
3. Calculate the equivalent resistance of the circuit represented by table 1 and table 3.
4. Read from the graph the approximate total current in all the circuits if a battery of 10 V was used.

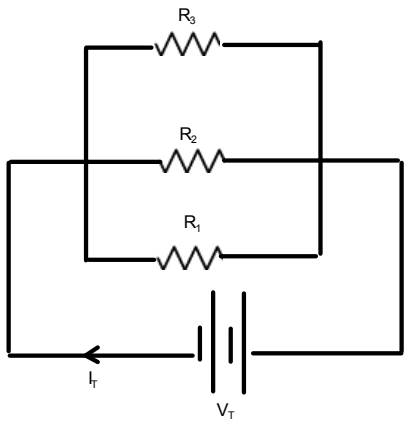
Ohm's Law Practice

1. Calculate the resistance of a light bulb that has a voltage drop of 15 V when there is 2.5 A of current.
2. Calculate the current drawn from a 12 V battery connected to a circuit with an equivalent resistance of 72 Ω.
3. A resistor connected to a 9.5 V battery has 3.7 A going through it. Calculate its resistance.
4. Two 9.0 V batteries are used to power a circuit with an equivalent resistance of 270 Ω. What current is drawn from the batteries?
5. What is the battery voltage necessary to power a circuit with 5.5 A of current if the circuit's resistance is 25 Ω?

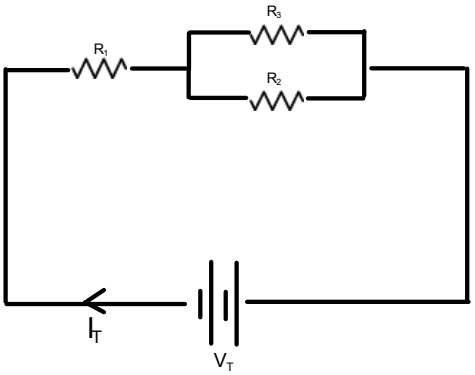
Solving Circuit Schematics (keep answers to one decimal place)



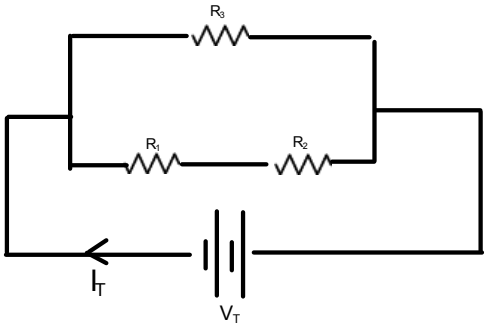
#	V (V)	I (A)	R (Ω)
1	20		10
2			
3			5.0
	$V_T = 45$	$I_T =$	$R_{eq} =$



#	V (V)	I (A)	R (Ω)
1			15
2			
3		2.5	
	$V_T = 60$	$I_T = 8.0$	$R_{eq} =$



#	V (V)	I (A)	R (Ω)
1			3.0
2			5.0
3	20		
	$V_T = 50$	$I_T =$	$R_{eq} =$



#	V (V)	I (A)	R (Ω)
1			5.0
2			
3			10
	$V_T = 40$	$I_T = 7.0$	$R_{eq} =$