

Shedding Light on Electricity Episode 4: Voltage, Current, and Resistance

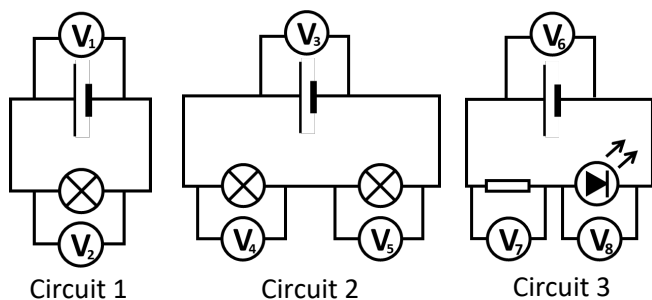
Name: _____

- Part A**
1. In Australian homes, the voltage of the power supply is about _____ Volts.
 2. For a given voltage, if one electrical device requires more power than another, it will draw more/less current.

- Part B**
3. Substances that electric current (or, in other words, electrons) can flow through easily are called _____. Examples include _____, _____, and _____.
 4. Substances that electric current can't flow through easily are called _____. Examples include _____, _____, and _____.
 5. If two light-globe filaments are connected to the same voltage, the filament that resists the flow of current more (and therefore has a higher "resistance") will allow more/less current to flow than the filament with a lower resistance. A filament with a lower resistance will allow more/less current to flow.

- Part C**
6. What typically happens to the electrical current in a circuit if the voltage of the power supply is increased? _____
 7. Voltage is always measured between two points in a circuit. What is it a measure of? _____

8. The voltage between the two terminals of AAA (and, in fact AA) batteries is _____.

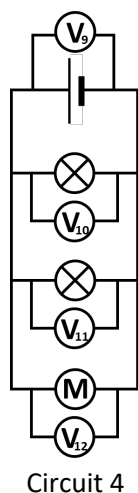


9. If voltmeter V_1 in Circuit 1 reads 6 volts, what does voltmeter V_2 read? _____

10. If voltmeter V_3 in Circuit 2 reads 12 volts and the two light globes were identical, what do voltmeters V_4 and V_5 read?

11. If voltmeter V_6 in Circuit 3, reads 9 V (which

means that the battery is a 9 V battery) and voltmeter V_7 reads 7 V, what would voltmeter V_8 read? _____



12. If two light globes and a motor were connected in parallel to a 12-volt car battery (Circuit 4), what would the voltmeters read?

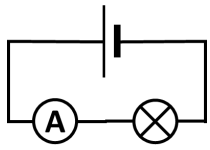
V_9 : _____, V_{10} : _____, V_{11} : _____, V_{12} : _____

13. In general, when electrical devices are connected in parallel to a power source, what can be said about the voltage across each one compared to the voltage of the power source? _____

14. Given that the voltage supplied to houses in Australia is 240 V, what is the voltage across all our lights and power sockets (which are all connected in parallel)?

- Part D**
15. Briefly describe what electrical resistance means. _____

16. Resistance is measured in _____ and this unit has the symbol _____.
17. Write down the three variations of the formula that links voltage, current, and resistance.



18. A car taillight is connected to a 12.6 Volt car battery and it draws a current of 2 amps. What is the resistance of the light globe?

V = _____ I = _____ (write down the data in the question and then...)

(use the equation...) R =



19. A headlight with a resistance of 4 Ω is connected to a 12.6 V car battery. How much current will it draw?

R = _____ V = _____

I =

20. A 6 W LED light globe is designed to operate at a voltage of 240 V. If it draws 0.025 Amps, what is its resistance?

V = _____ I = _____

R =

21. A wire's resistance depends on four things:

- (a) _____
- (b) _____
- (c) _____
- (d) _____

22. All incandescent light globes (the light globes that generate light by getting really hot) have filaments that are made of tungsten steel. Why is tungsten steel used? _____

23. How do manufacturers change the resistance of the different incandescent light globes? _____

24. Draw a circuit diagram that includes a battery, a light globe, an ammeter and a voltmeter, so that the ammeter can measure the current flowing through the light globe and the voltmeter can measure the voltage across it.

25. Ammeters have a very _____ resistance.

26. Voltmeters have a very _____ resistance.