

**Ohm's Law**  
**Georg Ohm 1787-1854**

**Quiz**

No.	Answer	Comments
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

**Notes**

## Ohm's Law Worksheet

1. Define Ohm's Law

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2. Why is it better for the batteries to use the **kilo ohm** rather than an **ohm** range of resistors?

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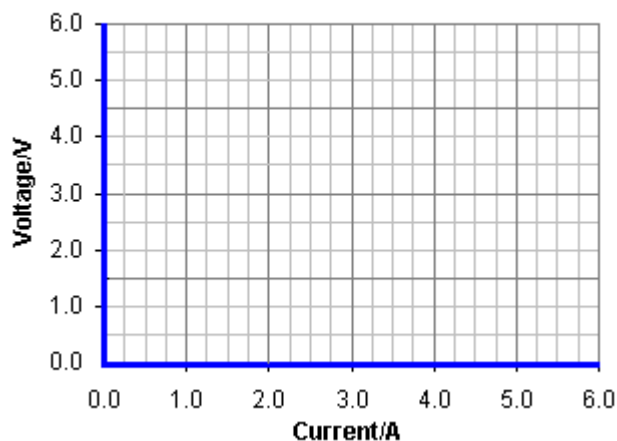
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*Calculate data for the following chart and use the program to check the values, use  $I=V/R$*

Resistor/ $\Omega$	1 k $\Omega$	2 k $\Omega$	3 k $\Omega$
Voltage/V	Current/A	Current/A	Current/A
6.0	6.0		
4.5			
3.0			
1.5			

3. Now try plotting a graph of **Voltage against Current** for each resistor on the same graph.

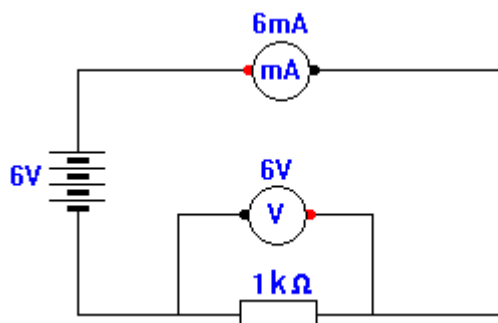
Voltage against Current



4. Measure the **gradient** of each line, do you notice anything?

## Ohm's Law Practical

1. Connect up the circuit and take readings of current and voltage.

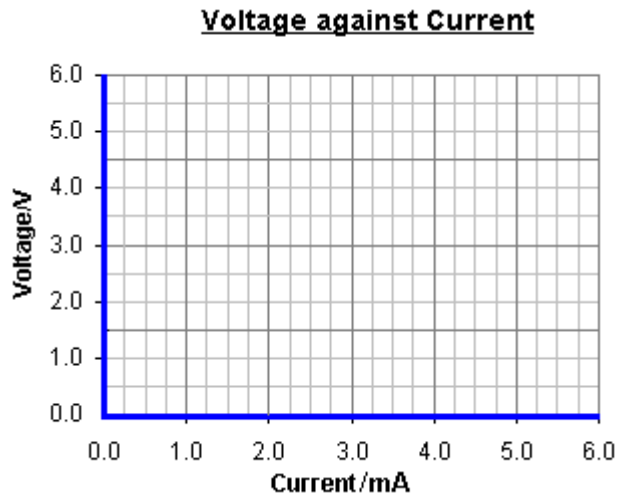


2. Now change the values of the resistor and the number of batteries and complete the following table

		Resistor		
		1 k $\Omega$	2 k $\Omega$	3 k $\Omega$
Number of Batteries	Voltage /V	Current /mA	Current /mA	Current /mA
4				
3				
2				
1				
0				

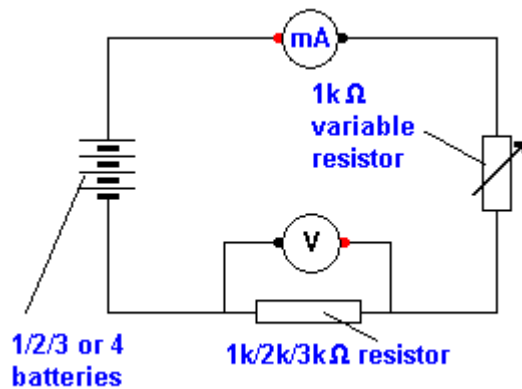
3. Are the values exactly the same as the ones in the worksheet or program, if not can you explain this?

4. Now try plotting a graph of **Voltage against Current** for each resistor on the same graph

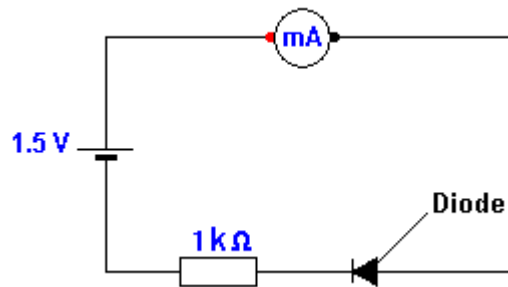


Measure the **gradient** of each line, do you notice anything?

The circuit below can also be used for a full investigation of Ohm's Law for various components

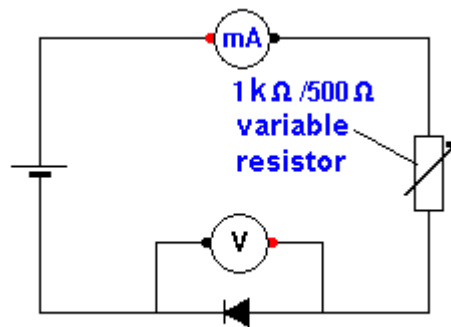


## Diode Practical



Take a reading of the milliammeter, reverse the direction of the diode and then take another reading. What did you notice?

## Diode Characteristics



Connect up the circuit as shown, and vary the value of the variable resistor. Draw up a table of current and voltage. Reverse the battery and record these readings. Plot the **current against forward and reverse voltage**. Check with your teacher to see what the graph should look like.

## ALTERNATING CURRENT A.C.

No.	Answer	Description
1		
2		
3		
4		
5		

### Discussion

(1) Sketch what you think A.C. would look like after it has been passed through a diode.

(2) How long does it take to charge up a typical mobile 'phone?

(3) What is the big heavy object inside a mobile 'phone charger?

(4) Why does the charger get hot at the beginning of the charging cycle?

(5) Where in the home would you find D.C. power supplies?

## Electrical Problems/Homework/Test

1. A bulb of  $10\ \Omega$  carries a current of  $1.2\ \text{A}$ , what voltage is across the bulb?
2. A car's headlamps pass a current of  $15\ \text{A}$ . If the car's battery is  $12\ \text{V}$ , what is the overall resistance of the headlamp circuit?
3. A  $1\ \text{M}\Omega$  resistor is attached across a  $12\ \text{kV}$  power supply, what current will flow?
4. A hand-held neon screwdriver passes a current of  $0.01\ \text{mA}$  when a  $240\ \text{V}$  terminal is touched, what is the total resistance of the circuit?
5. A  $12\ \text{V}$  battery is connected across a pair of  $4\ \Omega$  and  $2\ \Omega$  resistors in series. What current flows in each resistor, and what is the voltage across each one?

