

Answers



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pencil lead resistance

1. Convert 400 micro Amps (μA) into Amps. **$1\mu\text{A} = 1 \times 10^{-6}\text{A} = 0.000001\text{A}$. So divide by 1 million. $400\mu\text{A} = 0.0004\text{A}$**
2. If the current through a wire is 250 micro Amps at a voltage of 9V what resistance is the wire? **$V=IR$ so $R = V/I$ $R = 9/(0.00025) = 36000\Omega$**
3. Use a spreadsheet to record all my measurements and find the resistance for each current value. Plot resistance vs length for each lead type. Be careful with your units.
4. Describe how you could determine the type of pencil lead used to draw a line. **Using the data from the video our your own experiment you can figure out the resistance of 1cm of each type of pencil lead. Measure the resistance of the line and then divide by its length. The number you get should match the value for one of the types of lead.**
5. Have a look at the page on series and parallel resistors. Can you do that experiment using pencil lead on paper like in this experiment? **The series example is very simple, a pencil line 5cm long is just a 2cm in series with a 3cm and so on. The parallel example should be doable but remember that in physics most of the time we use wires with very low resistance whereas in this experiment every length of lead has a high resistance. we could draw patterns like this to test the parallel resistance equation, but remember to measure the whole length of each path the current can take.**

