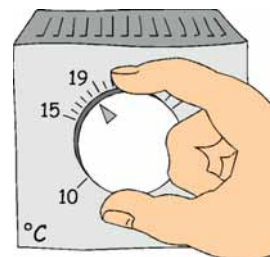


Lab: Ohmic Materials, Part One

There are some materials that conduct electricity so that the *current* that flows through it is *linearly proportional* to the applied voltage. Such a material is called “Ohmic”. If you know that a material is Ohmic, you can tell what the current is just by knowing how much voltage you are applying. Predictability is important for certain electrical hardware.



Questions: *Is an electrical resistor Ohmic?*
Is a light bulb Ohmic?

EQUIPMENT: This lab requires a variable voltage source; a voltmeter; an ammeter; small Christmas-tree type light bulbs (many of which will get burned out during the experiment, so have an ample supply); and an electrical resistor of about [what size? I forgot to note].

Pre-lab Discussion **Whole Class** **10 minutes**

Assign roles (or remind them to).

Show them the equipment they'll be using.

*Do *not* short out the circuit through the ammeter.*

*Do *not* exceed 5 Volts through the light bulbs. If they bust, they can't take more data.*

Shut off the box when finished.

Turn down voltage before switching around equipment.

Planning the Experiment **Groups of 4** **20 minutes**

“How many data points are sufficient to prove whether something is linear or not?”

“How much data can you take in an hour?”

“What will you do to avoid the kind of problems in the lab report(s) you evaluated last week?”

Have them use the first week's lab as a guide, esp the 'Summary.'

Data Collecting **Groups of 4** **40 minutes**

Check in with them about (guess what) how they are dealing with variation in the data.

Class Discussion **Whole Class** **25 minutes**

They should report on their experimental design (so that they can evaluate each other and themselves, especially as to how they dealt with variation in the data). If they want, they may make a qualitative guess about their results, but real analysis waits til next week. These reports need to be snappy and/or not all the groups report.

Writing the Report **Groups of 4** **15 minutes**

Today they should write the journal, record their data, and evaluate their experimental design. Next week they will do the data analysis and evaluate it. They don't turn anything in this week.