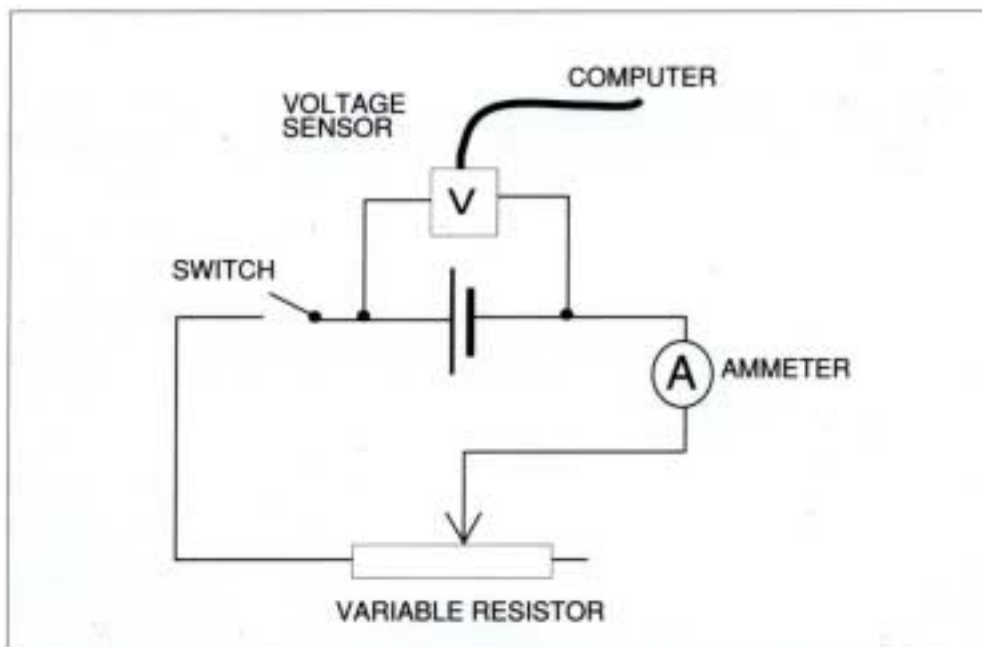


ELECTRICITY

1. WHICH BATTERY IS BEST?

Electronic calculators, portable cassette players and electrical toys tend to use very different types of batteries according to the different jobs they are needed for. Some are slim and pencil shaped, some are chunky and some are tiny disks. What is the difference in performance of different types of battery and how are these differences related to the job they normally do?



PLAN Plan an investigation to discover how quickly the voltage across a battery falls when it supplies a heavy current, and then recovers when the current is switched off.

Decide which types of battery are available for testing.

For the circuit shown above, find out or take advice on the range of suitable currents that can pass. Choose a value of current for your experiment. Also choose the time for which you will allow the current to flow before switching off.

ASK YOUR TEACHER TO INSPECT YOUR COMPLETED CIRCUIT BEFORE SWITCHING ON THE CURRENT.

APPARATUS

Two or more different types of battery in suitable holders
Ammeter
Variable resistor
Connecting leads
Voltage sensor(s)

COMPUTER

Inputs: 1. Voltage
 (2. Voltage)

Timespan: 2-5 minutes or longer

DISCUSS AND FIND OUT

Look at the time interval and make suitable measurements to find the decay and recovery time of the voltage when the current is switched on.

How are the results affected by the size of the chosen current and the length of time for which it is switched on?

GOING FURTHER

Study the fall in voltage when a current is applied for a longer period of time. How long does it take for the voltage to fall to 50% of its starting value?

Compare the performance of different sizes of battery and ones using different chemicals.

Make a list of gadgets that use batteries and for each write a note of how you think a suitable battery might perform. For example:

- Voltage stays very steady.
- Can give short bursts of high current.

Add other properties if you wish.